ICP DAS WISE
User Manual
for WISE-790x(D) Series

[Version 1.26]

ICP DAS CO., LTD.

泓格科技股份有限公司

Warning

ICP DAS Inc., LTD. assumes no liability for damages consequent to the use of this product. ICP DAS Inc., LTD. reserves the right to change this manual at any time without notice. The information furnished by ICP DAS Inc. is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS Inc., LTD. for its use, or for any infringements of patents or other rights of third parties resulting from its use.

Copyright and Trademark Information

© Copyright 2009 by ICP DAS Inc., LTD. All rights reserved worldwide.

Trademark of Other Companies

The names used for identification only maybe registered trademarks of their respective companies.

License

The user can use, modify and backup this software on a single machine. The user may not reproduce, transfer or distribute this software, or any copy, in whole or in part.

Table of Contents

1 Introduction 7
2 Before Connection 10
3 Website Overview 12
4 Basic Setting 15
4.1 Name Setting 15
4.2 Time Setting 15
4.3 Ethernet Setting 17
4.4 Module Setting 17
4.5 Password Setting 18
5 Advanced Setting 19
5.1 DI Attribute Setting 19
5.2 DO Attribute Setting 20
5.3 AI Attribute Setting 22
5.4 AO Attribute Setting 24
5.5 Internal Register Setting 25
5.6 Timer Setting 26
5.7 Schedule Setting 27
5.8 Email Setting 29
5.9 CGI Command Setting 31
5.10 Recipe Setting 31
5.11 P2P Setting 33
6 Rules Setting 36
6.1 IF Condition 38
6.2 THEN/ELSE Action 47
6.3 Summary of the Rules 57
6.4 Rule Manager 59
7 Download to Module 62
8 Upload from Module 63
9 Channel Status 64
10 LED Functions 65
11 Firmware Update 66
11.1 Introduction 66
11.2 Install / Uninstall WISE Firmware Uploader 66
11.3 Update WISE firmware 69
Appendix I：Modbus Address Table 73

List of Figures

Figure 1-1：WISE system architecture 7
Figure 1-2：WISE Series Products 8
Figure 2-1：The switch is located at the back of the controller 10
Figure 2-2：Select “Search” function on MiniOS7 Utility 10
Figure 2-3：IP Setting button on MiniOS7 Scan 11
Figure 2-4：Network Settings page 11
Figure 3-1：Login page of WISE Web UI 12
Figure 3-2：Main page of WISE Web UI 12
Figure 3-3：WISE Web UI Operation Procedures 13
Figure 4-1：Name Setting page 15
Figure 4-2：The Name location in WISE Web Page 15
Figure 4-3：Time setting page 16
Figure 4-4：Ethernet setting page 17
Figure 4-5：X-Board Module setting page 17
Figure 4-6：Password setting page 18
Figure 5-1：DI Attribute setting page 20
Figure 5-2：DO Attribute setting page 21
Figure 5-3：AI attribute setting page 22
Figure 5-4：AI Deadband Operation(> or >= a numerical value) 23
Figure 5-5：AI Deadband Operation(< or <= a numerical value) 23
Figure 5-6：AI Deadband Operation(= a numerical value) 24
Figure 5-7：AO Attribute setting page 24
Figure 5-8：Internal Register setting page 25
Figure 5-9：Timer setting page 26
Figure 5-10：Schedule setting page 27
Figure 5-11：Schedule Calendar setting page 28
Figure 5-12：Email setting page 29
Figure 5-13：Email channel value encoded syntax 30
Figure 5-14：CGI Command setting page 31
Figure 5-15：Recipe setting page 32
Figure 5-16：Recipe Action management 32
Figure 5-17：P2P setting page 33
Figure 5-18：WISE-7100 Controller Selection 34
Figure 5-19：Select WISE-4000 Controller 35
Figure 5-20：WISE-7901 Controller Selection 35
Figure 6-1：Rules setting page 36

Figure 6-2：Enable rules, edit rules and status display.....36
Figure 6-3：Rule setting page.....37
Figure 6-4：AI condition setting page.....38
Figure 6-5：DI condition setting page.....39
Figure 6-6：DI counter condition setting page.....40
Figure 6-7：DO counter condition setting page.....41
Figure 6-8：Internal register condition setting page.....41
Figure 6-9：Timer condition setting page.....43
Figure 6-10：Schedule condition setting page.....43
Figure 6-11：P2P IF Condition setting page.....44
Figure 6-12：P2P IF Condition detail setting page.....45
Figure 6-13：Rule Status IF Condition setting page.....45
Figure 6-14：”One-Time Action” & ”Repeat Action” Items.....47
Figure 6-15：AO action page.....48
Figure 6-16：DO action page.....49
Figure 6-17：DI counter action page.....49
Figure 6-18：DO counter action page.....50
Figure 6-19：Internal Register action page.....50
Figure 6-20：Timer action page.....51
Figure 6-21：Schedule action setting.....52
Figure 6-22：Email action page.....53
Figure 6-23：CGI Command action page.....53
Figure 6-24：Recipe action page.....54
Figure 6-25：P2P action page.....54
Figure 6-26：P2P action detail setting page.....55
Figure 6-27：Rule Status action page.....55
Figure 6-28：Clear/Save Rules.....57
Figure 6-29：Rule setting main page.....57
Figure 6-30：Rule Manager setting page.....59
Figure 6-31：Rule Copy setting page.....59
Figure 6-32：Rule Reset setting page.....60
Figure 6-33：Rule Reorder setting page.....60
Figure 6-34：Rule Swap setting page.....61
Figure 7-1：Showing download progress.....62
Figure 7-2：Message showing a successful download.....62
Figure 8-1：Message showing a successful upload.....63
Figure 9-1：Channel Status page.....64
Figure 10-1：The LED display shows network information and channel values.....65

Figure 11-1：Install WISE Firmware Uploader.....66
Figure 11-2：Select installation directory.....67
Figure 11-3：Display installation progress.....67
Figure 11-4：Complete the installation.....67
Figure 11-5：Start to remove WISE Firmware Uploader.....68
Figure 11-6：Remove WISE Firmware Uploader (1).....68
Figure 11-7：Remove WISE Firmware Uploader (2).....68
Figure 11-8：Complete uninstalling WISE Firmware Uploader.....69
Figure 11-9：Launch WISE Firmware Uploader.....69
Figure 11-10：Select the WISE module type.....70
Figure 11-11：Assign IP address.....70
Figure 11-12：Select the WISE firmware.....71
Figure 11-13：Upload firmware.....71
Figure 11-14：Display firmware update progress.....71
Figure 11-15：Complete firmware update.....72

1 Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive HMI interface that allows users to implement control logic on controllers just a few clicks away; no programming is required. With this powerful and easy-to-use software, it will minimize the learning curve, shorten time to market and dramatically reduce the labor and cost spent on system development. WISE system architecture is shown as below:

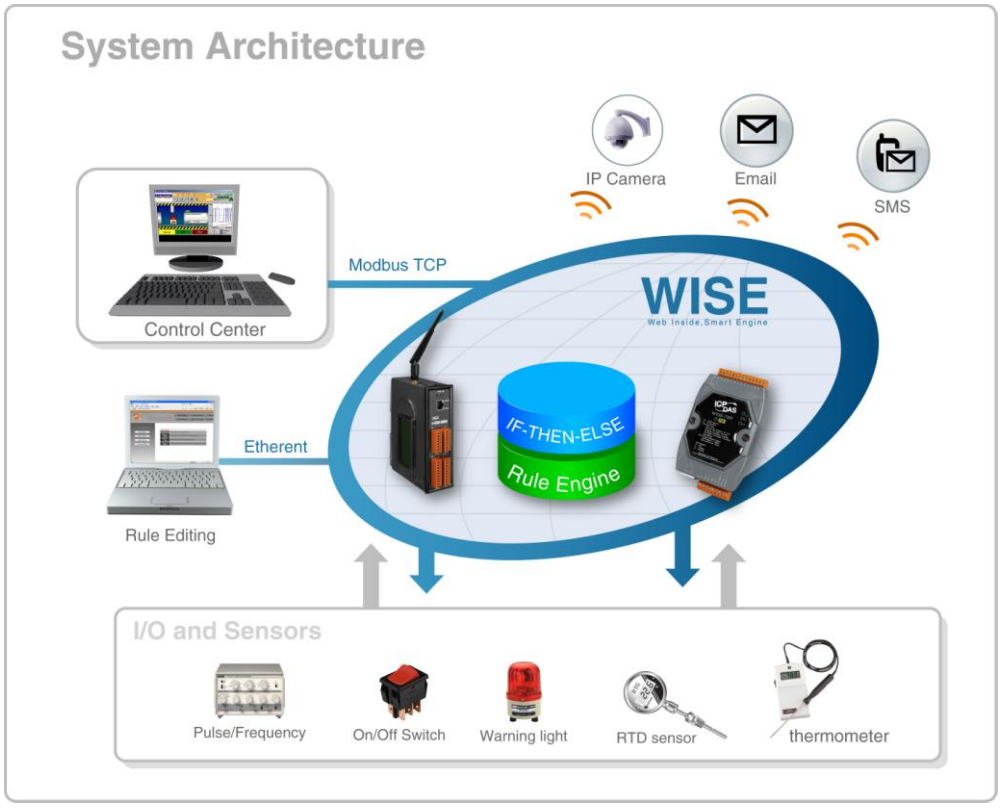


Figure 1-1：WISE system architecture

Through Web browser, users can access Web Server on ICP DAS WISE controllers to perform tasks such as logic edition and download. A Rule Engine will be set up to manage and deploy rules for controllers. The Rule Engine will check whether the rules are valid or not and determine the execution of actions under specific conditions, for examples: setting up I/O channel values, perform scheduled tasks, sending Email or sending SMS message under a specific condition. In addition, through the Modbus TCP Protocol, it enables SCADA software to control and monitor I/O channel or system status on controllers in real time.

WISE system features:

- **IF-THEN-ELSE logic rules execution ability**

  WISE controller equips with an IF-THEN-ELSE logic Rule Engine, it offers up to 36 IF-THEN-ELSE rules for users to set up the logic content. After completing rule edition and downloading rules to the WISE controller, the Rule Engine will loop execute the rules in accordance with the execute order under specific conditions.

- **No programming is required to implement logic content on controllers**

  WISE provides user-friendly Web UI pages for editing control logic on the controllers. It enables to implement logic edition by a few clicks on the mouse to set up and deploy logic rules without writing a single line of code.

- **No extra software tool is required; all operations can be done through the Web browsers**

  WISE HMI interface runs on regular Web browsers. To edit control logic, it only requires a browser to connect to the Web server on WISE controller. No extra software tool installation is needed on the target PC.

- **Support various hardware controllers that are with different I/O types**

  The wide range of I/O function modules ICP DAS provided allows users to find best solutions that meet their requirements. Please refer to the following table for modules and functions:

Functions	Without Display	With Display
Analog Input Modules	WISE-71xx Series	
Multi Function I/O		
Digital I/O		
Relay Output & Digital Input		
I/O Expansion Boards	WISE-7901	WISE-7901D
SMS	WISE-4000	WISE-4000D

Figure 1-2：WISE Series Products

- **Provide Timer and Schedule operation**

  WISE features two kind of timing functions: Timer and Schedule. It allows user to schedule specific date or time for control logic execution, or perform specific tasks such as time delay.

- **Real-time remote alarm via SMS or Email and CGI command sending functions**

  WISE supports SMS, Email and CGI command sending functions. SMS and Email functions are important functions for real-time message communication. The sending action can be added to the logic edition as part of logic control to provide real-time message transmission function or sending CGI command for device control in response to specific events.

- **Fully P2P function between WISE controllers**

  WISE offers P2P function that enables WISE controllers to directly communicate with other remote WISE controllers on networks. All WISE controllers can freely share their status information such as I/O channel value, DI/DO Counter or Internal Register to each others. The P2P operations can be incorporated into WISE logic rules as Condition statements or Action statements for Condition evaluation criteria or Action executions.

- **Recipe function for Group Action operation**

  WISE provides Recipe function that allows to execute a sequence of actions previously saved in the Recipe to response to IF-THEN-ELSE logic rules Conditions. Different Recipe sets can be edited to meet various requirements for different applications.

- **Real-time monitoring system status of controllers**

  WISE supports Modbus TCP Protocol for users to perform real-time monitoring and control of the controllers. Please refer to Appendix 1 for the mapping table of controller system information and Modbus TCP protocol Address. In addition, WISE provides an easy-to-view HMI web interface for real-time monitoring. It allows users to get important real time system information even without SCADA software.

- **Password protection for access control when download logic rules**

  WISE HMI web page offers password protection; it allows users to modify the password for access control when download the logic rules.

This document is intended to give you a full-range instruction to WISE-790x/ WISE-790xD controllers. You will be able to learn how to edit logic of the rules and how to download the rules to the controllers for conditional execution.

2 Before Connection

Before connecting to WISE Web HMI pages, please complete the following steps for network configuration. The network configuration of the controllers has to be set up for users to connect to Web server on WISE controllers.

- Please make sure the Init/Normal switch on the controller has been switched to "Normal" position. Connect the controller to power supply and to the network. The Init/Normal switch position is shown as below:

Figure 2-1：The switch is located at the back of the controller

- Install and execute MiniOS7 Utility. MiniOS7 Utility can be downloaded from the following link (please download version v321 or later):
  http://ftp.icpdas.com/pub/cd/8000cd/napdos/minios7/utility/minios7_utility/

- On toolbar, select Connection→Search (shown as below). A "MiniOS7 Scan" window will pop up and automatically start searching controllers in the network.

Figure 2-2：Select "Search" function on MiniOS7 Utility

- After finish searching, find the target controller and click "TCP Broadcast", and then click "IP Setting" button on the toolbar as shown below:

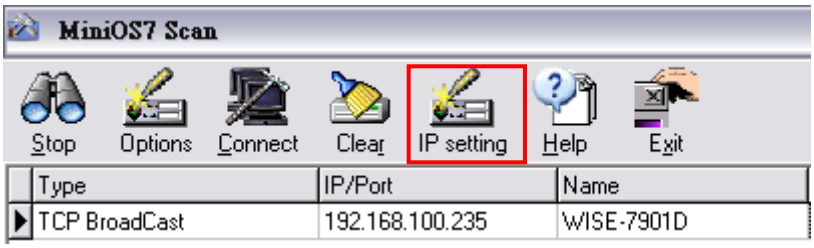


Figure 2-3：IP Setting button on MiniOS7 Scan

- Click "IP Setting" button, a network settings window will pop up. Input the information and click the "Set" button to complete the settings.

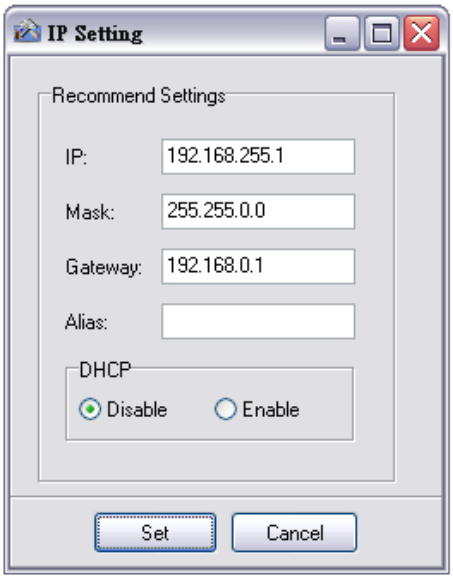


Figure 2-4：Network Settings page

- After finish Network settings, reboot the controller for the changes to take effect.

3 Website Overview

Please use IE or Firefox browser to connect to Web server on WISE controller. In order to get a better operation experience, 1280x1024 resolution is recommended. The main page of WISE controller Web page is shown as below:

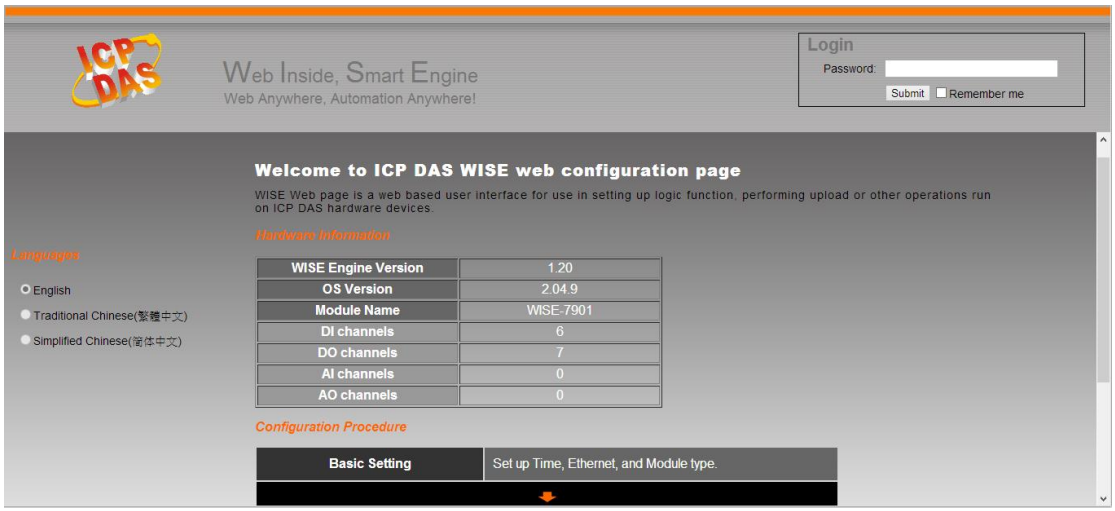


Figure 3-1：Login page of WISE Web UI

You will be required to enter the password to login into the page before performing logic settings. The login section is on right upper corner, and the default password is "**wise**". After login, the main web page of WISE controller is shown as below:

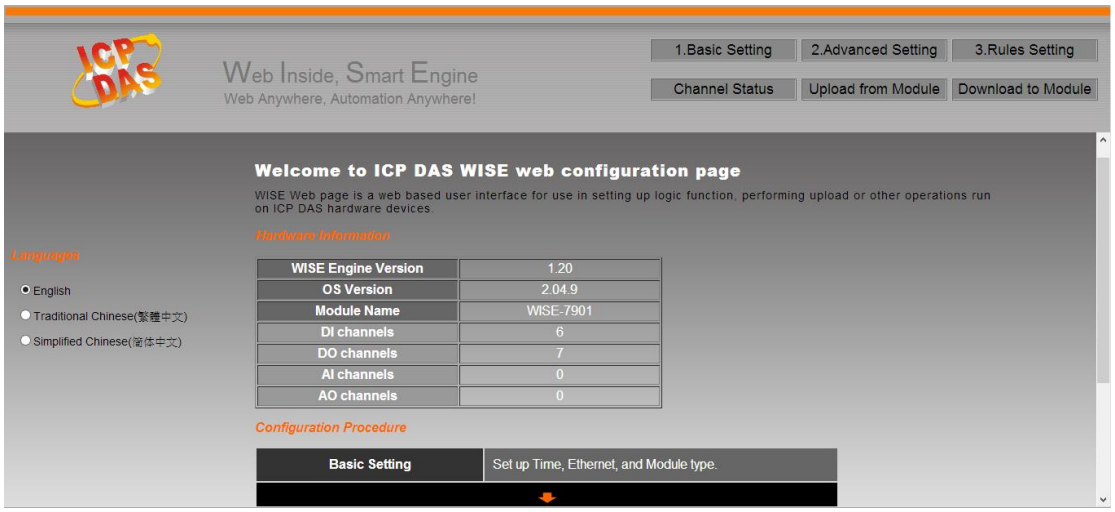


Figure 3-2：Main page of WISE Web UI

Six buttons will appear on the upper part of the Web page:

- Basic Setting
- Advanced Setting
- Rules Setting
- Channel Status
- Upload from Module
- Download to Module

The main page will display the WISE firmware version information, module information and general operating procedures. The procedures are as follows:

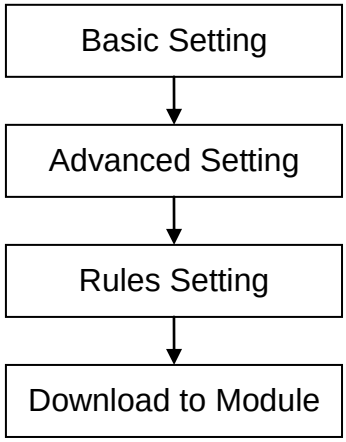


Figure 3-3：WISE Web UI Operation Procedures

Please note: DO NOT refresh the Web page when you are editing the pages, otherwise the contents of all previous settings will be gone. And please remember all settings will take effect only when they have been downloaded to modules, if you close the Web page before finishing “Download to Module”, all settings will be disappeared as well.

In addition, there is a language selection menu on the left region of the main page. WISE Web UI offers: English, Traditional Chinese and Simplified Chinese for users to choose their prefer languages. The system will memorize previous language selection, and will automatically switch to the previously chosen language next time when connected to the WISE Web UI. Please note: do not select the language during the process of Rule edition; otherwise the previous edited content might disappear. It is recommended to perform language selection at the beginning when connected to the WISE Web UI or after finishing “Download to Module”.

WISE-790x equips v1.20(or later) firmware would upload the rule setting automatically when the web page is connected.

More detail information of each button will be given in the following parts.

4 Basic Setting

Under the Basic Setting section, users can set up Name Setting, Time Setting, Ethernet Setting, Module Setting and Password Setting for controllers.

4.1 Name Setting

Name Setting Page is for you to give your controller a name for easy recognition and identification. Name Setting Page is shown as follow:

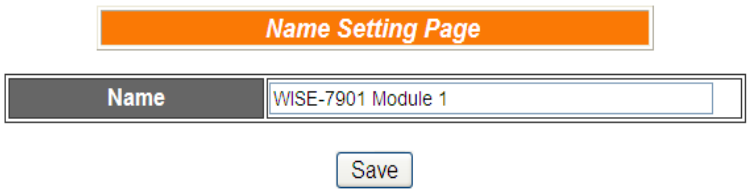


Figure 4-1：Name Setting page

If you have already given a name to this controller, when you get on this page, the name you previously set up will be shown on the pane. After you modify or input the name, click Save to save the name. The name you input will appear on the top of the page as shown below. Please note: the Save button on Name Setting Page is for temporary storage only, to complete the Name Setting and save the change to the controller, please finish the process of “Download to Module”.

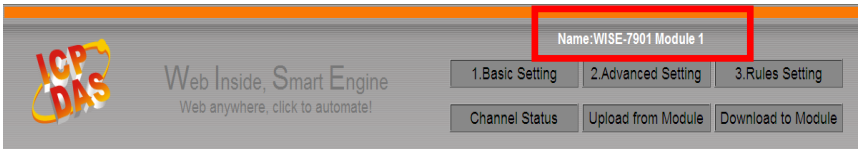


Figure 4-2：The Name location in WISE Web Page

4.2 Time Setting

Time Setting is for setting up time on hardware devices. The following figure illustrates the set up interface:

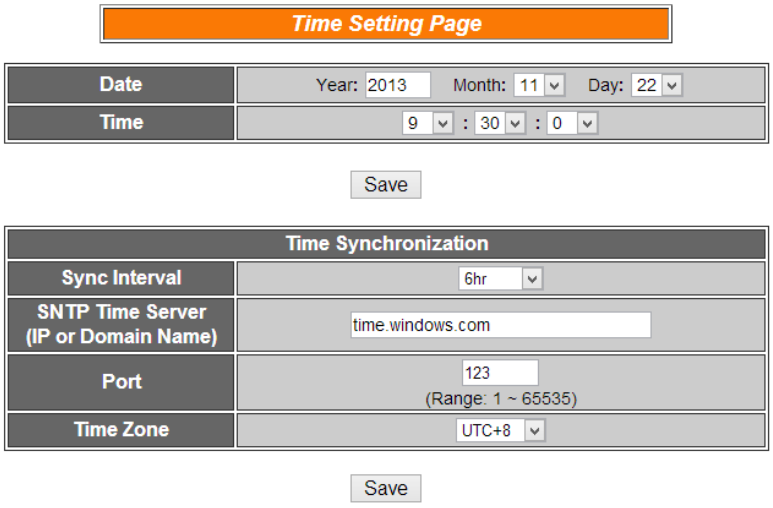


Figure 4-3：Time setting page

On every entry you make, this page will display current date and time that are read from the hardware device clock. You can remotely modify the date/time of the hardware device clock here. After you finish modification, click “Save” to save all changes to the hardware devices.

WISE-790x also has the ability to sync the clock to an SNTP time server for time synchronization through the network. The Time Synchronization Setting is shown as follow:

i. In the “Sync Interval” field, select the time interval to specify how often will the WISE-580x automatically connect to SNTP time server for time synchronization through the network. If you select “disable”, it means the time synchronization function will not be performed.

ii. In the “SNTP Time Server” field, input the IP address or domain name of the SNTP Time Server. Please refer to the link: “time.windows.com”- this is a standard SNTP server from Microsoft for Windows operating system to synchronize the system time.

iii. In the “Port” field, input the port number which the SNTP time server open for connection, the default port number will be “123”.

After all settings are completed, click “Save” button to save the changes. And please remember all settings will take effect only when they have been downloaded to modules, if you close the Web page before finishing “Download to Module”, all settings will be disappeared as well.

4.3 Ethernet Setting

Ethernet Setting allows you to perform network configuration on hardware devices. The following figure illustrates the configuration interface:

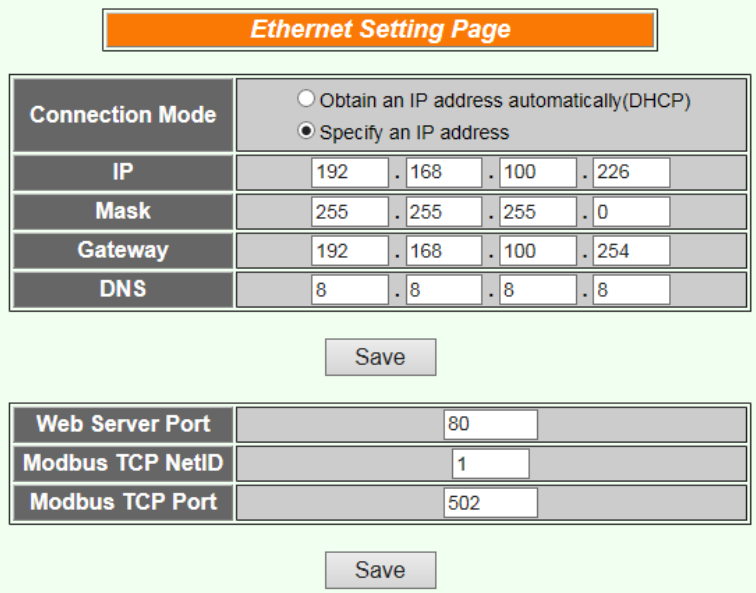


Figure 4-4：Ethernet setting page

Each time when you enter this page, it will display current network configuration and Modbus settings that are automatically read from the hardware devices. For Ethernet settings, you can select “Connection Mode” as “Obtain an IP address automatically(DHCP)” to let the controller to get the IP from DHCP server, or select “Specify an IP address” to modify the IP/Mask/Gateway/DNS configuration of the controller manually. You can also modify the web server port, the Modbus TCP NetID and the Modbus TCP Port in the same way.

Please note: if you make any modification to the network configuration, the hardware device will reboot itself and re-connect to the web page automatically about 5 seconds later.

4.4 Module Setting

Module Setting page allows users to select the module type for the plug-in X-Board as shown below:

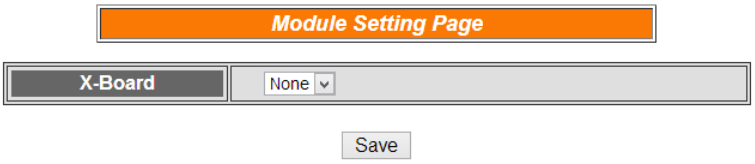


Figure 4-5：X-Board Module setting page

Please select the corresponding X-Board module type from the drop down list and save the settings.

4.5 Password Setting

Password Setting allows users to change the password and password hint for access control when download logic rules. The Password Setting page is as follow:

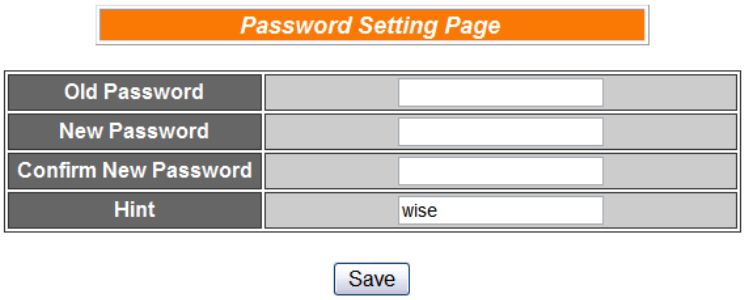


Figure 4-6：Password setting page

To avoid unauthorized access and altering of data; it is required for users to input password before they start to download control logic to the controllers. The default password for access control is set as "**wise**". You can modify the password and password hint on this page. Password length is limited to 16 characters and the password hint length is limited to 20 characters.

5 Advanced Setting

Advanced Setting provides additional features and allows you to perform channel configuration on hardware devices. Click the Advanced Setting button, a column of buttons will appear on the left of the page:

- DI Attribute Setting
- DO Attribute Setting
- AI Attribute Setting
- AO Attribute Setting
- Internal Register Setting
- Timer Setting
- Schedule Setting
- Email Setting
- CGI Setting
- Recipe Setting
- P2P Setting

Please note: In order to avoid possible error when performing rule definition (IF-THEN-ELSE), please always finish configuration in Advanced Setting before starting to define Rules. Avoid unnecessary change in Advanced Setting after you finish rule definition. Unexpected errors might occur if you violate this sequence: Advanced Setting→ Rule Setting. In case you make any modification, please double check your settings and Rules definition to make sure no errors are present.

For each module may carry different I/O channels, if the related DI Attribute Setting, DO Attribute Setting, AI Attribute Setting or AO Attribute Setting does not apply to the selected module, the corresponding buttons will appear “Disable”. The following sections will describe more detail information for these configurations.

5.1 DI Attribute Setting

DI Attribute setting page allows to set up detail DI channel counter configuration. The configuration page is shown as below:

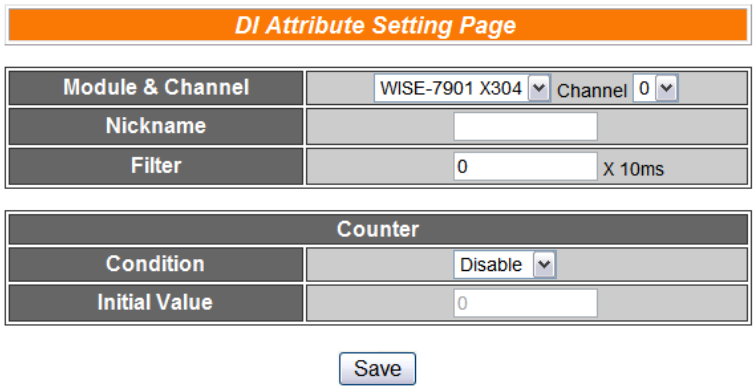


Figure 5-1：DI Attribute setting page

Follow the following steps:

i. Specify the channel you are going to configure by selecting channel index from the dropdown list of channel field in “Module & Channel” section.

ii. Input Nickname for each I/O channel, this nickname will be displayed on the “Channel Status” page.

iii. Input the time interval in the “Filter” field. The time interval for filter is the minimum duration a signal has to present to make a change to the DI channel value. If the signal last shorter than this filter time interval, this signal change will be determined to be noise instead of a valid signal change. Default Filter time interval will be 0 and this value must be multiples of 10ms, for example, a setting of 20 would mean a 200 ms filter (20 x10 ms).

iv. Please set the trigger criteria for triggering the counter to count. There are three criteria: HI to LOW, LOW to HI and Status Change. If you select “Disable” indicates that the counter of this DI channel will not function.

v. You can set the initial value of the counter in the “Initial Value” field. This counter will start counting from the initial count value. The default initial value is 0.

vi. Repeat steps i ~ v. After all DI channel settings are completed, click “Save” button to save the changes.

5.2 DO Attribute Setting

DO Attribute Setting page allows to set up detail configuration of DO channel, including Power On value, Counter and Pulse Output. You don’t need to finish all configurations; configure the one(s) according to your

needs. The configuration page is shown as below:

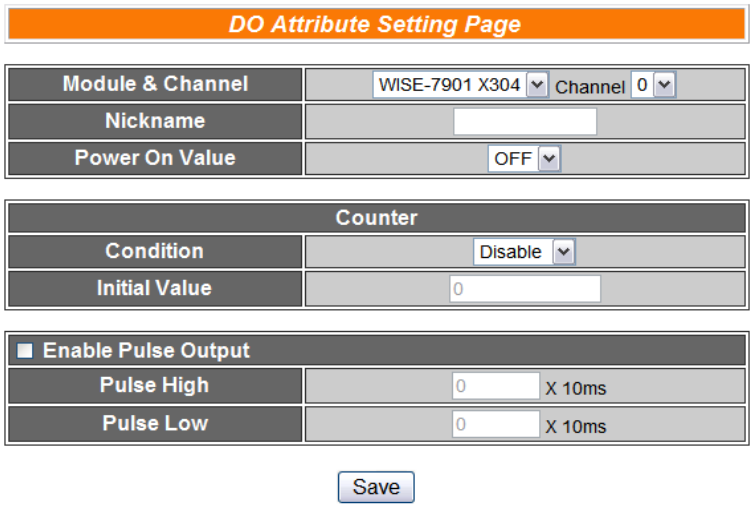


Figure 5-2：DO Attribute setting page

Follow the following steps:

i. Specify the channel you are going to configure by selecting channel index from the dropdown list of channel field in “Module & Channel” section.

ii. Input Nickname for each I/O channel, this nickname will be displayed on the “Channel Status” page.

iii. You can specify the initial status to be “ON” or to be “OFF” when the hardware device is power on. Select the value from the dropdown list of “Power On Value” field. The default value is “OFF”.

iv. You can set the trigger criteria for triggering the counter to count. There are three criteria: HI to LOW, LOW to HI and Status Change. This field cannot be “Disable” if you want to use the counter function of this channel. You can also specify the initial value of the counter in the “Initial Value” field. This counter will start counting from the initial count value. The default initial value is 0.

v. If you check the Enable pulse output checkbox, it will allow this DO channel to perform pulse output. In Pulse Output mode, the selected DO channel will generate a square wave according to specified parameters (Pulse High and Pulse Low). Pulse High and Pulse Low are required and has to be entered in multiples of 10ms. Pulse High indicates the “ON” time duration and Pulse Low indicates the “OFF” time duration in a periodic Pulse cycle.

vi. Repeat steps i ~ v. After all DO channel settings are completed, click “Save” button to save the changes.

5.3 AI Attribute Setting

AI Attribute Setting section is for specifying a Deadband value and a scale range for the AI channel on the WISE controller. As we know, when the controller receives a signal from AI channel, if the change of this value received matches the evaluation criteria that was previously defined in Condition statements; the result of this IF-THEN-ELSE evaluation will be "true". In order to avoid signal oscillation that may result in instability to the status changes, the user can set up a Deadband value for the AI channel; when there is a change to the AI channel, the actions will occur when this change matches the evaluation criteria value plus or minus the Deadband value. The AI attribute configuration page is shown as below:

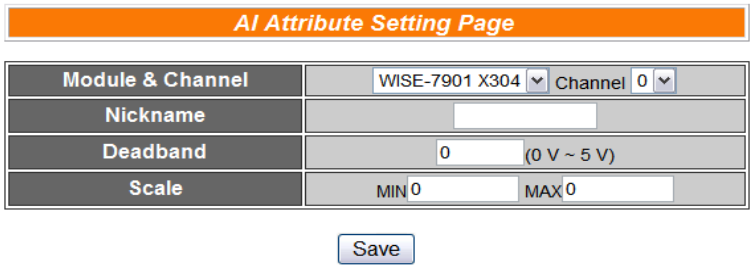


Figure 5-3：AI attribute setting page

Follow the following steps:

i. Specify the channel you are going to configure by selecting channel index from the dropdown list of channel field in "Module & Channel" section.

ii. Input Nickname for each I/O channel, this nickname will be displayed on the "Channel Status" page.

iii. You can set the Deadband value of this AI channel in the "Deadband" field, on the right side of the Deadband field, the AI channel value range will be displayed. For example, the channel value range is -5V ~ 5V in Figure 5-3. The default Deadband value is 0.

iv. In the "Scale" field, AI channel raw data can be set to operate with linear proportion between "MIN" and "MAX" values. IF Condition will use the adjusted value in the logic Rule operation, and the AI value retrieved from Modbus TCP and Web HMI would be the adjusted value. The default value for MAX and MIN is 0, it mean disable the Scale function.

v. Repeat steps i ~ iv. After all AI Channel settings are completed, click "Save" button to save the changes.

There are three operation styles for AI Deadband. Detail description is as below. The AI Channel setting in following examples is 0mA ~ 20mA.

(1) When AI > or >= a numerical value :

Assuming the Deadband value is set to be 2 mA, and the following statements are defined in the related logic Rule: IF AI0>10mA, THEN DO=ON, ELSE DO=OFF, that means, when AI0 receives a signal that exceed 10mA, the DO channel will change to ON immediately, however, when the AI0 channel value drops and becomes lower than 10mA, the DO channel will not change back to OFF immediately until the value reaches 8mA (10mA minus the Deadband value 2mA), as shown in following figure.

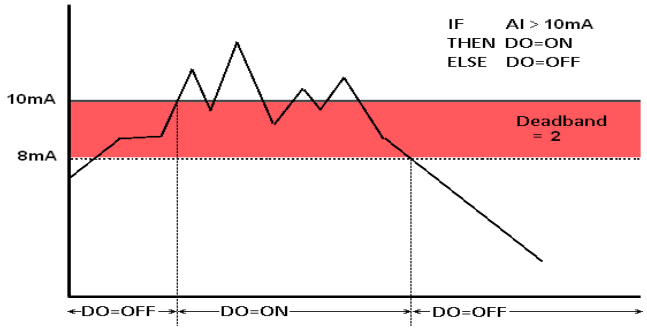


Figure 5-4：AI Deadband Operation(> or >= a numerical value)

(2) When AI < or <= a numerical value :

Assuming the Deadband value is set to be 2 mA, and the following statements are defined in the related logic Rule: IF AI0<10mA, THEN DO=ON, ELSE DO=OFF, that means, when AI0 receives a signal which is lower than 10mA, the DO channel will change to ON immediately, however, when the AI0 channel value exceed 10mA, the DO channel will not change back to OFF immediately until the value reaches 12mA (10mA plus the Deadband value 2mA), as shown in following figure.

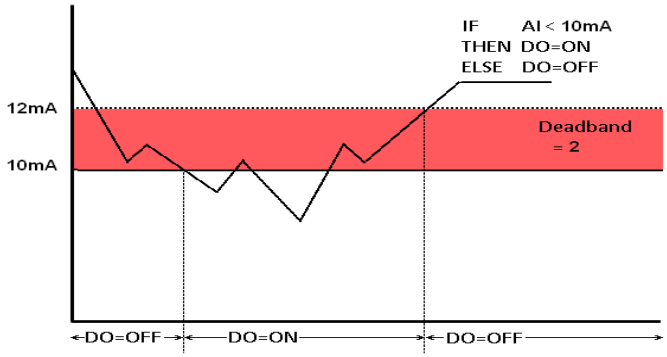


Figure 5-5：AI Deadband Operation(< or <= a numerical value)

(3) When AI = a numerical value :

Assuming the Deadband value is set to be 1 mA, and the following statements are defined in the related logic Rule: IF AI0 = 9mA, THEN DO=ON, ELSE DO=OFF, that means, when AI0 receives a signal between 8mA (9mA minus the deadband value 1mA) and 10mA (9mA plus the deadband value 1mA), the DO channel will change to ON immediately. However, when the AI0 channel value exceed 10mA, or is lower than 8mA, the DO channel will change to OFF, as shown in following figure.

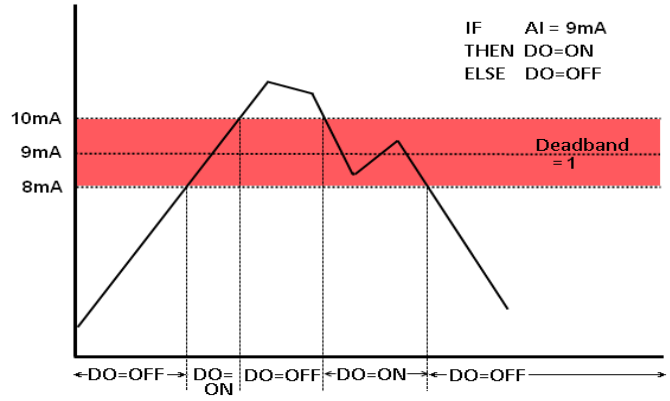


Figure 5-6：AI Deadband Operation(= a numerical value)

5.4 AO Attribute Setting

AO Attribute Setting page allows to set up initial value of the AO channel. The configuration page is shown as below:

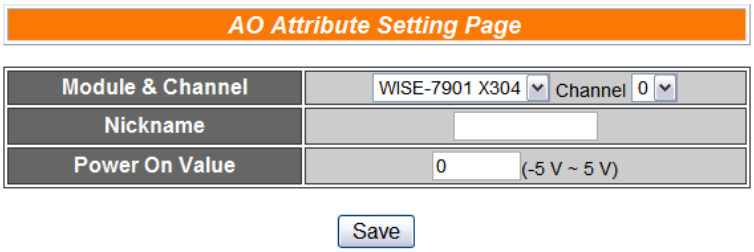


Figure 5-7：AO Attribute setting page

Follow the following steps:

i. Specify the channel you are going to configure by selecting channel index from the dropdown list of channel field in “Module & Channel” section.

ii. Input Nickname for each I/O channel, this nickname will be displayed on the “Channel Status” page.

iii. You can set the initial value of the AO channel in the “Power On

Value" field. The hardware device will output this value when is power on. The default initial value is 0.

iv. Repeat steps i ~ iii. After all AO Channel settings are completed, click "Save" button to save the changes.

5.5 Internal Register Setting

WISE provides 48 Internal Registers; they can be used to hold temporary variables and to read/write data via Modbus address. The configuration page is shown as below:

Figure 5-8：Internal Register setting page

Follow the following steps:

i. A checkbox appears in front of each Internal Register; check the checkbox to enable the Internal Register, or check the checkbox in the "Enable" field to enable all Internal Register in the same row also. Input a value if you want to set a default value that the Internal Register, and set the nicknames for the Internal Register, this nickname will be displayed on the "Channel Status" page.

ii. After you finish all the Internal Registers selections and settings, click “Save” button to save the settings.

5.6 Timer Setting

WISE provides 12 groups Timer for timing functions. The Timer status can be “Not Timeout” or “Timeout”. They can be included in the IF Condition statements. The Timer Action can be “Start” or “Reset”. The Start Action will start to run the Timer and if the Start Action is triggered one more time when the Timer is running, the Timer will restart again. The Reset action will reset the Timer and stop running the Timer. The Timer will be in “Timeout” status only when the Timer is running and reached the setting time, otherwise, the status of Timer will remain in “Not Timeout”. The Timer setting interface is shown as below:

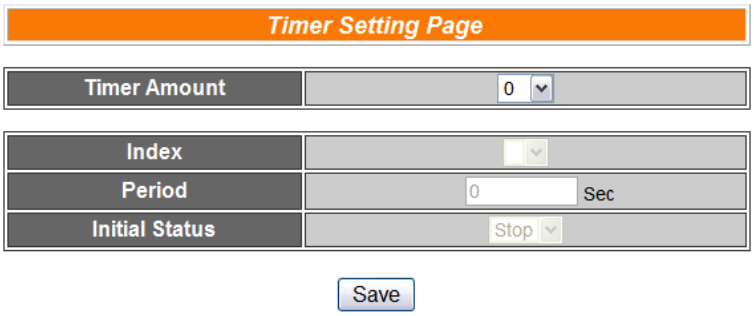


Figure 5-9：Timer setting page

Follow the following steps:

i. “Timer Amount” field is required. Select the total number of timer you are going to use from the dropdown list.

ii. Specify the timer you want to set up by selecting its index number from the dropdown list of the “Index” field.

iii. “Period” field is required for each timer; please input the period interval in units of seconds.

iv. Specify the initial status of each timer from the dropdown list of the “Initial Status” field. Select “Start” indicates the timer will start to count as soon as the hardware device is power up. “Stop” indicates the Timer will remain off when the hardware device is power up; it will not be activated until being triggered under certain conditions. The default setting of initial Status is “Stop”.

v. Repeat steps ii ~ iv. After all timer settings are completed, click “Save” button to save the changes.

5.7 Schedule Setting

WISE provides 12 groups of Schedules to setup prescheduled routine tasks. The status of Schedule function can be “In Range” or “Out of Range”, they can be included in the IF Condition statements. The Action of Schedule can be “Enable” or “Disable”. Please note, if the Schedule is disabled, the status will be “Out of Range”. Schedule setting page is shown as below:

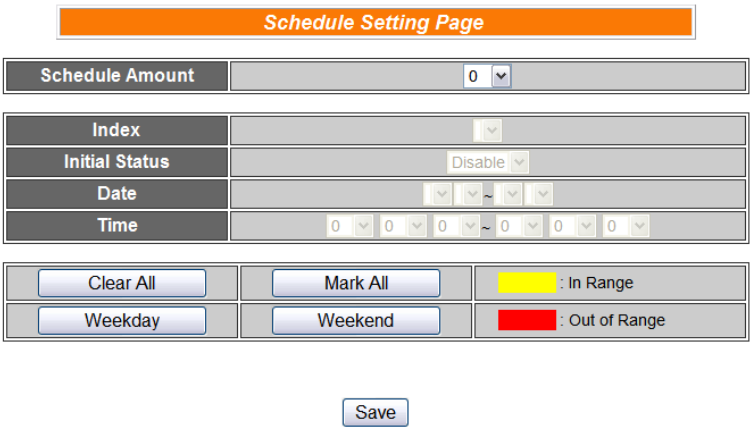


Figure 5-10：Schedule setting page

Follow the following steps:

i. Select the total number of schedule you are going to use from the dropdown list of the “Schedule Amount” field.

ii. Specify the schedule you want to set up by selecting its index number from the dropdown list of the “Index” field.

iii. Specify the initial status of each schedule from the dropdown list of the “Initial Status” field. “Enable” indicates the schedule will be activated as soon as the hardware device is power up. “Disable” indicates the schedule will remain inactive when the hardware device is power up, it will not be activated until being triggered under certain conditions.

iv. Set up the Year and Month for this Schedule execution duration. When you select the start date and end date for the schedule, please note the end date must be greater than the start date. After you specify the Year and Month in the Date section, the calendars corresponding to the Year and Month you specified will appear as shown below:

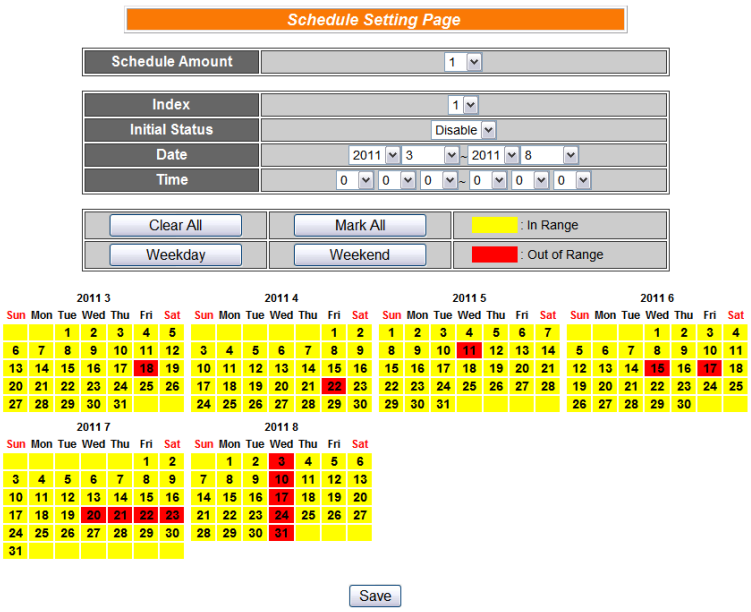


Figure 5-11：Schedule Calendar setting page

v. Input the schedule In Range time. If you specify an end time that is earlier than the start time, such as 20:00:00 ~ 06:00:00, it indicates the end time will be set one day after the start date..

vi. On the calendars, click to toggle highlight on the dates you'd like to execute or not execute the operations for this Schedule. If the date shows a yellow background, it indicates the date is In Range, that is, that date falls into the range that will execute the operations. On the contrary, if the date shows a red background, it indicates that date is Out of Range, that is, that date falls out of the range and will not execute the operations. By default, all dates will be In Range, that is, during the date range you select, the operation will be executed every day. Clear All button is used to reset all dates to be In Range; whereas Mark All button is for marking all dates to be Out of Range. The Weekday button is for you to select all Mondays to Fridays to be In Range, and Saturdays and Sundays to be Out of Range, that is, the operations will be executed during weekdays only. On the contrary, the Weekend button is for you to set all Saturdays and Sundays to be In Range, and all Mondays to Fridays to be Out of Range, that is, the operations will be executed during weekends only.

vii. Repeat steps ii ~ vi. After all schedule settings are completed, click "Save" button to save the changes.

5.8 Email Setting

WISE supports up to 12 Email messages. This function allows sending pre-input Email message(s) to pre-set Email receiver(s) under certain conditions. The configuration page is shown as below:

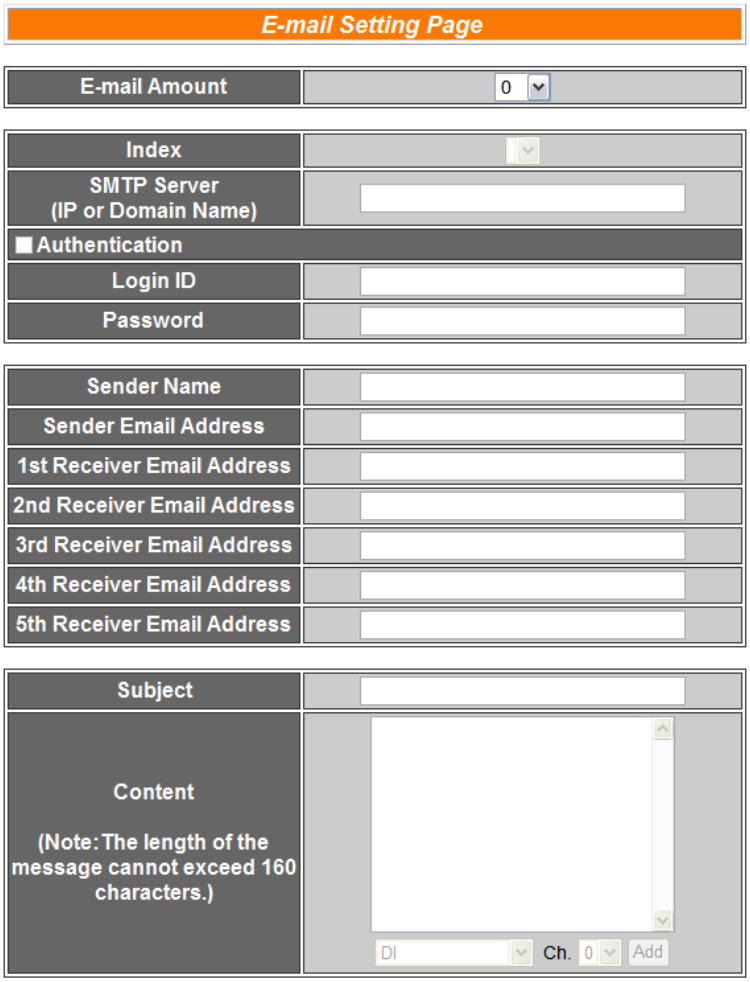


Figure 5-12：Email setting page

Follow the following steps:

i. Specify the numbers of email messages you want to set up from the dropdown list of the “E-mail Amount” field.

ii. Specify the email group number from the dropdown list of the “Index” field.

iii. Enter the IP or the domain name of the SMTP server in the “SMTP Server” field.

iv. If SMTP server requires account and password validation, please select the Authentication Checkbox, and continue steps v~vi to login into the SMTP server. If SMTP server don’t need account and password validation, uncheck the Authentication Checkbox and skip

steps v~vi, go directly to step vii.

v. Enter the SMTP server login ID in the “Login ID” field.

vi. Enter the SMTP server password in the “Password” field.

vii. Enter the sender’s name in the “Sender Name” field.

viii. Enter the sender’s email address in the “Sender Email Address” field.

ix. Enter the receiver’s email address in the “1st ~5th Receiver Email address” field. Please note: you can input up to 5 receivers, at least one email address has to be entered. Please enter the email address in sequence to avoid possible error.

x. Enter the email subject in the “Subject” field.

xi. Enter the content in the “Content” field. The length of the content cannot exceed 160 characters. In addition, Email provides an encoded string that allow user to add current channel value into Email content. The syntax is shown as below:

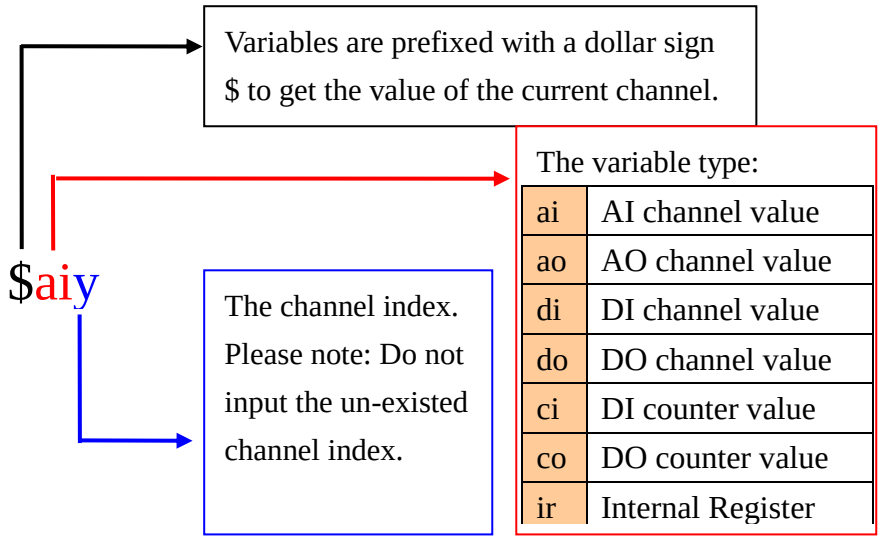

Variables are prefixed with a dollar sign $ to get the value of the current channel.
The variable type:
ai AI channel value
ao AO channel value
di DI channel value
do DO channel value
ci DI counter value
co DO counter value
ir Internal Register
$aiy
The channel index. Please note: Do not input the un-existed channel index.

Figure 5-13：Email channel value encoded syntax

The user can also add channel value encoded string into Email content from the I/O channel selection interface.

xii. Repeat steps ii ~ xi. After all email groups settings are completed, click “Save” button to save the changes.

Please note: WISE-790x Email sending function can only work with the SMTP Email server that uses port 25 and must be without SSL cryptographic protocols. A self-hosted SMTP server is recommended for Email sending function. Please visit WISE FAQ web page (http://wise.icpdas.com/FAQ.html) for more Email setting information.

5.9 CGI Command Setting

WISE offers up to 12 sets of CGI Command setting. This function allows sending pre-input CGI Command to pre-set Remote Server under certain conditions. The configuration page is shown as below:

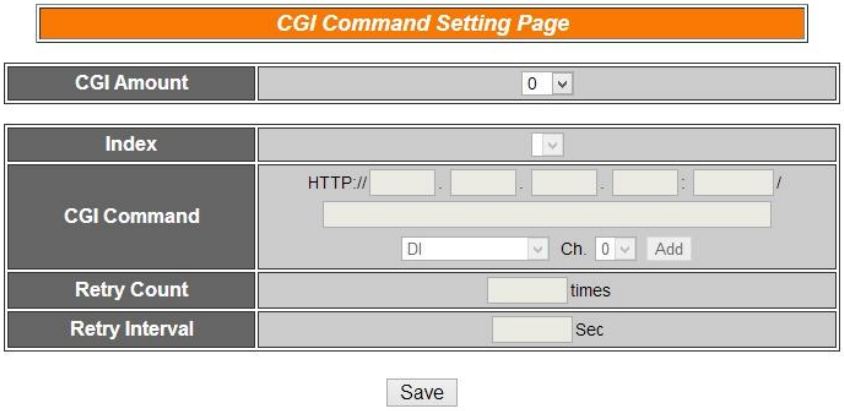


Figure 5-14：CGI Command setting page

Follow the following steps:

i. Specify the numbers of CGI Commands you want to set up from the dropdown list of the “CGI Amount” field.

ii. Specify the CGI group number from the dropdown list of the “Index” field.

iii. Enter the Remote Server IP, Port number and CGI Command in the “CGI Command” field. In addition, it provides an encoded string that allow user to add current I/O channel value into the CGI Command. You can use the I/O channel selection interface (shown as above) to add the I/O channel encoded string into the CGI Command.

iv. Enter the number in the “Retry Count” field. It means the retry number WISE will try when it can’t connect with Remote Server.

v. Enter the number in the “Retry Interval” field. It means the time interval between each retry connection. The unit is Second.

vi. Repeat steps ii ~ v. After all CGI groups settings are completed, click “Save” button to save the changes.

5.10 Recipe Setting

WISE offers up to 12 sets of Recipe setting. A sequence of actions can be stored and saved in a Recipe, users can setup to execute this sequence of actions that was previously stored in the Recipe when an IF condition is

matched. A Recipe contains a sequence of actions, therefore, we can say a Recipe is a macro for Actions. The configuration page for Recipe Setting is shown as below:

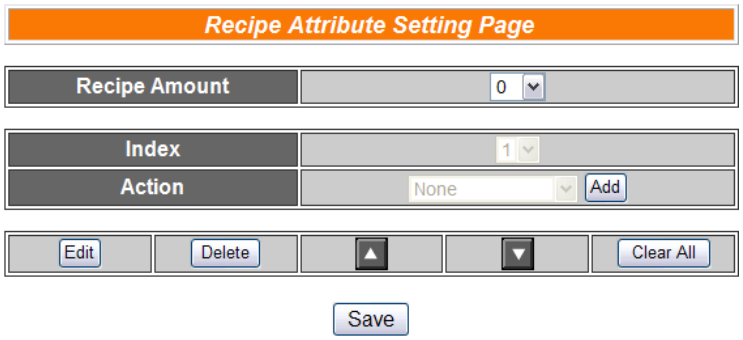


Figure 5-15：Recipe setting page

Follow the following steps:

i. Select the total number of Recipe you are going to use from the dropdown list of the Recipe Amount field.

ii. Assign an index number to the Recipe from the dropdown list of the "Index" field.

iii. Select a THEN/ELSE Action from the dropdown list of the Action field.

iv. Click the Add button. A THEN/ELSE Action Setting page will appear for you to set up related THEN/ELSE Action Settings, please refer to THEN/ELSE Action.

v. After you finish setting up THEN/ELSE Action Settings, the page will refresh automatically and the Actions will be listed on Recipe.

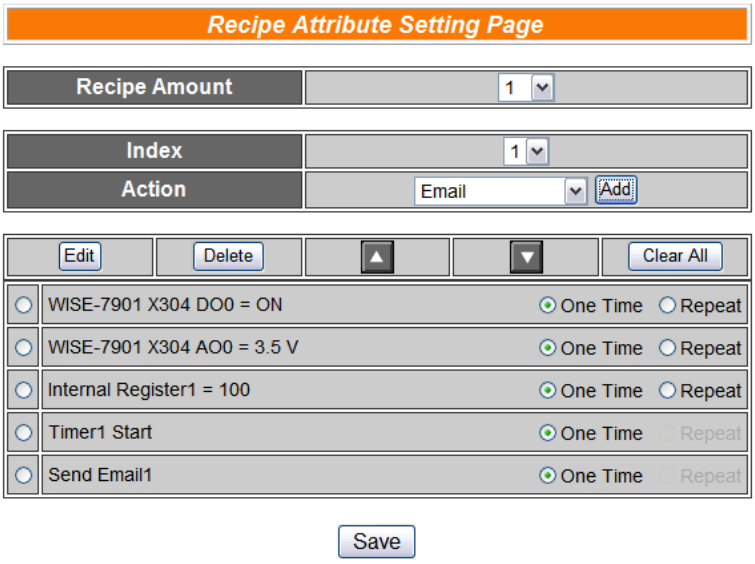


Figure 5-16：Recipe Action management

In order to meet application requirement, for some Actions, WISE offers options to execute the Action one-time or repeatedly.

- One Time：When the IF Condition is TRUE, this Action will be executed once and only once. This Action will not be executed again until the IF Condition turns to be TRUE again.
- Repeat：When the IF Condition is TRUE, this Action will be executed repeatedly until the IF Condition turns to be FALSE.

vi. All selected Actions will be listed on the Recipe page. Click on the radio checkbox to select the target Action, you can edit the selected Action by click on Edit button, or delete the Action from the list by click on Delete button. To rearrange the order of the Action, click the Move Up or Move Down button to move the target Action to the desired order. To delete all Actions, click on the Clear All button to remove all actions from the list.

vii. Repeat steps ii ~ vi. After all Recipe settings are completed, click "Save" button to save the changes.

5.11 P2P Setting

WISE supports up to 8 P2P Setting. This function enables WISE controllers to communicate with other remote controllers directly. The remote controllers can freely share their data such as I/O value, DI/DO Counter or Internal Register status information with local WISE controller. The configuration page is shown as below:

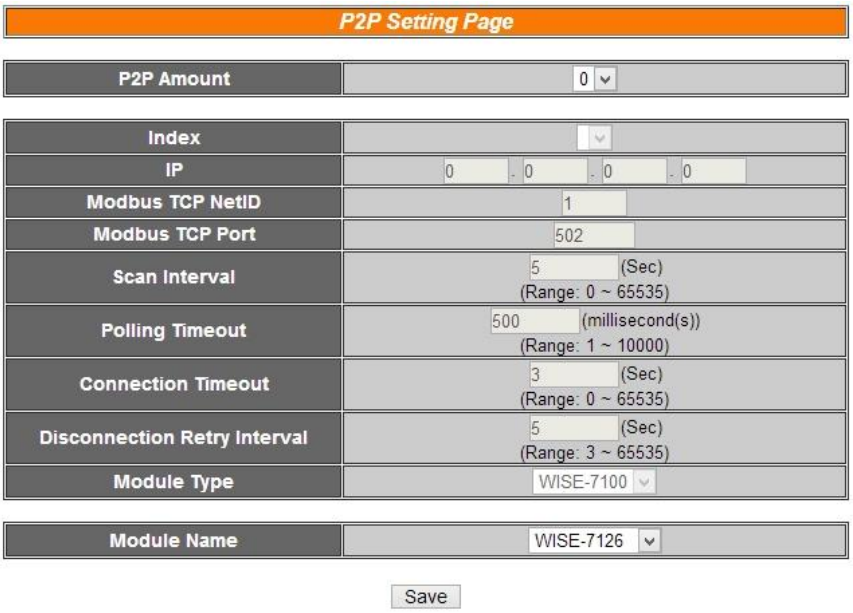


Figure 5-17：P2P setting page

Follow the following steps:

i. Select the total number of P2P settings you are going to use from the dropdown list.

ii. Assign an index number to the P2P setting from the dropdown list of the “Index” field.

iii. In the “IP” field, input the IP of the remote WISE controller that you want to communicate with.

iv. In the “Modbus TCP NetID” field, input the NetID of the remote WISE controller.

v. In the “Modbus TCP Port” field, input the Modsbu TCP port of the remote WISE controller.

vi. In the “Scan Interval” field, input the time interval in seconds. The controller will communicate with the target remote controller every specified time-interval. The default value is 5 seconds.

vii. In the "Polling Timeout" field, input the time in milliseconds. The time for the controller to send Modbus command to the remote WISE controller and wait for the response, The default value is 500 ms.

viii. In the "Connection timeout" field, input the time in seconds. The time for the controller to connect with the remote WISE controller and wait for the response, The default value is 3 seconds.

ix. In the "Disconnection Retry Interval" field, input the time interval in seconds. The controller will try to connect with remote WISE controller every specified time-interval after disconnection. The default value is 5 seconds.

x. In the Module Type field, select the type of the remote WISE controller. The module type currently divided into three categories:

(1) WISE-7100:

WISE-7100 offers WISE-71xx controllers to choose from. The configuration page for WISE-7100 is shown as below:

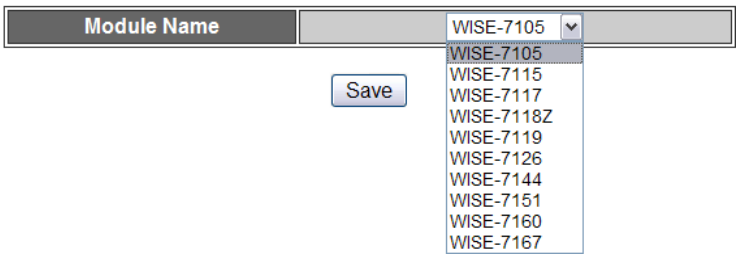


Figure 5-18：WISE-7100 Controller Selection

(2) WISE-4000

WISE-4000 offers only WISE-4000 controller. The configuration page for WISE-4000 is shown as below:

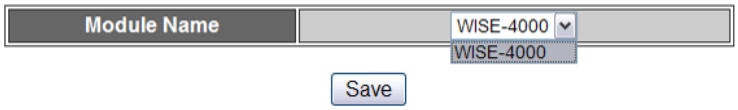


Figure 5-19：Select WISE-4000 Controller

(3) WISE-7901:

WISE-7901 can be used with ICP DAS XBoard. The XBoard type you select for the remote WISE controller has to match the actual one. The configuration page for WISE-7901 is shown as below, select the add-on Xboard from the list:

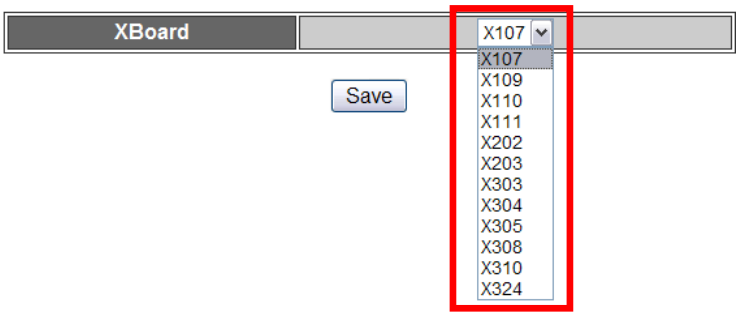


Figure 5-20：WISE-7901 Controller Selection

xi. In the Module Name, XBoard Module field, select the name of the remote WISE controller from the dropdown list.

xii. Repeat steps ii ~ xi. After all P2P settings are completed, click “Save” button to save the changes.

6 Rules Setting

After finishing all Advanced Setting configurations, the user can start to edit IF-THEN-ELSE rules. Click the “Rules Setting” button, a Rule Manager table will appear, and the list of rules will be displayed on the left side of the page. At the left side of the page, the status of each rule will be displayed. And at the right side of the page will show detail content of each rule that was previously defined by the users. The rule setting page is shown as below:

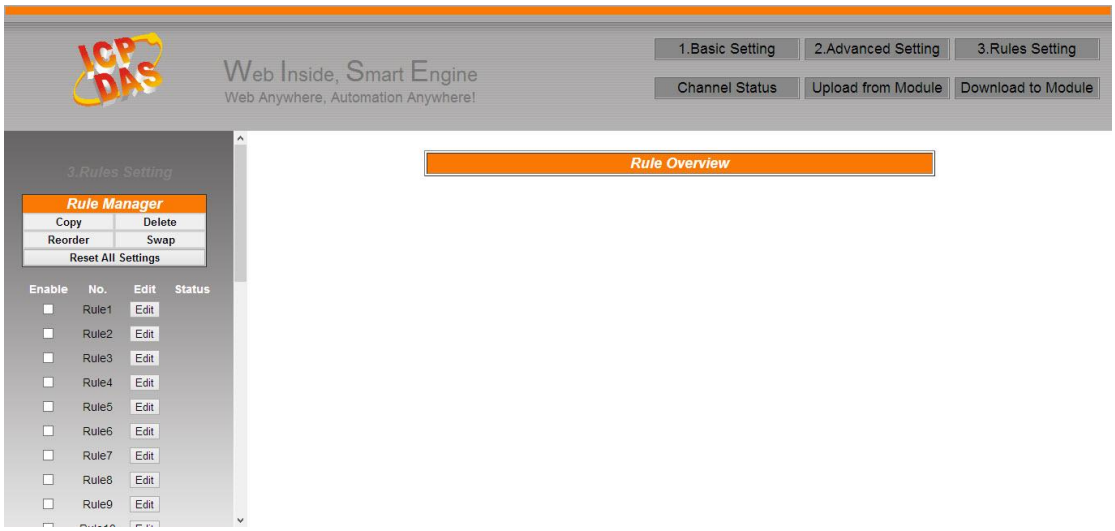


Figure 6-1：Rules setting page

On the left side of the page, a Rule Manager table will appear at the top of the page. It provides the “Copy”, “Reset”, “Reorder”, “Swap” and “Reset all Setting” functions. More detail information for Rule Manager will follow. Under the Rule Manager table, the list of rule contains four items:

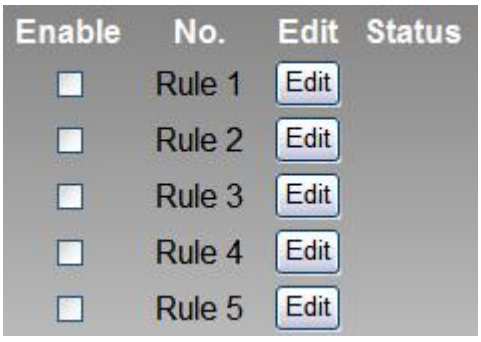


Figure 6-2：Enable rules, edit rules and status display

- **Enable**: A checkbox appears before each rule; check the checkbox to enable the rule and this rule will be executed after being downloaded, otherwise it will only be stored temporarily.
- **No.**: Indicates the identification number of the rule. To avoid possible error,

it is recommended to assign the identification number in sequence.

- **Edit**: Click the Edit button to edit detail logic content of the rule.
- **Status**: "OK" indicates this rule is successfully defined. "Error" indicates there is error occurs. "Disable" indicates this rule not be executed. Please note: if you make modification in Advanced Setting after finish defining the rules, it might cause unexpected error due to the changes, some variables may no longer exist. Therefore, in case you make any modification, please double check your settings and Rules definition to make sure no errors are present.

Click the "Edit" button, the Rules Setting page will appear:

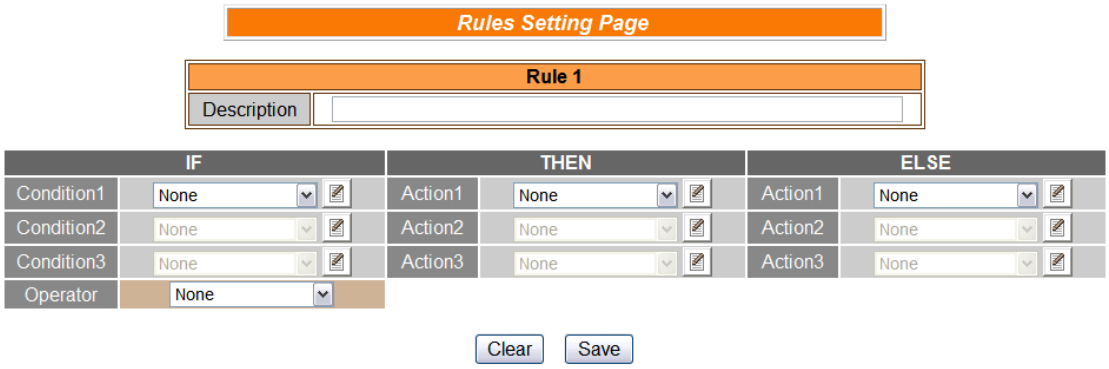


Figure 6-3：Rule setting page

The rule number will be displayed at the top of the page. The Description field provides a space for users to make a brief description of this Rule. An IF-THEN-ELSE Rule setting table appears under the description section. Each Rule offer 3 IF conditions. The user could create IF(condition) statements by selecting appropriate operator (AND, OR) from the dropdown list. In order to avoid possible errors, the design of this table is foolproof: The user has to finish setting up Condition1 before moving on Condition2, and so on. Each Rule also offers 3 THEN actions, and 3 ELSE actions. More detail information will follow.

6.1 IF Condition

In IF Condition statement, the following values or their status can be included as evaluation criteria:

- AI
- DI
- DI Counter
- DO Counter
- Internal Register
- Timer
- Schedule
- P2P
- Rule Status

If the hardware device equips with AI or DI channel, their corresponding AI or DI channel will automatically appear on the list. To include subjects other than AI or DI channels in the IF Condition statement; they have to be pre-defined in Advanced Setting first. The subjects that already being defined in Advanced Setting will appear on the dropdown list of IF Condition. Select the subject you want to use, and then click right side button, a window will pop up for you to edit detail information.

6.1.1 AI

AI channel value can be used as evaluation criteria for IF condition statement; the editing page for AI Condition Setting is shown as below:

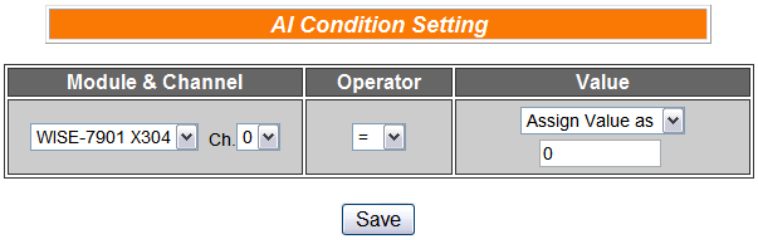


Figure 6-4：AI condition setting page

Follow the following steps:

i. Select the channel that you are going to use the value as evaluation criteria for IF condition statement. Specify the channel from the dropdown list of channel field in the “Module & Channel” section.

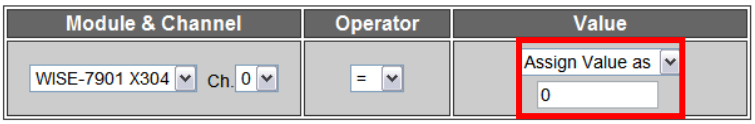
ii. Set up the expression statement for this channel value. Select an

operator from “=”,”>”,”<”,”>=” or “<=”.

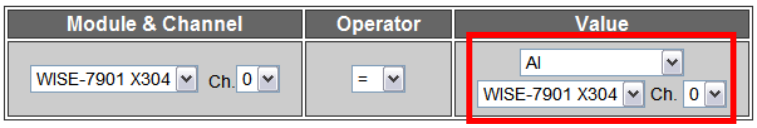
iii. Specify the evaluation value. If this AI channel value match the evaluation criteria, the result of this condition evaluation will be “true”.

You can compare the AI channel value with the following 3 values for condition evaluation:

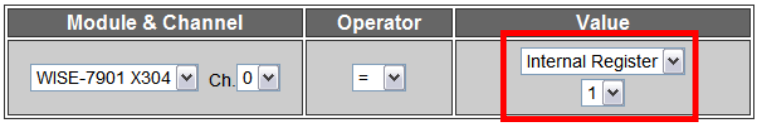
- Self-Defined value：Giving a self-defined value to compare with the AI channel value.



- AI Channel value：Using other AI channel values from the local module to compare with the AI channel value.



- Internal Register：Using the internal register value to compare with the AI channel value.



iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.1.2 DI

DI channel value can be used as evaluation criteria for IF condition statement; the editing page for DI Condition Setting is shown as below:

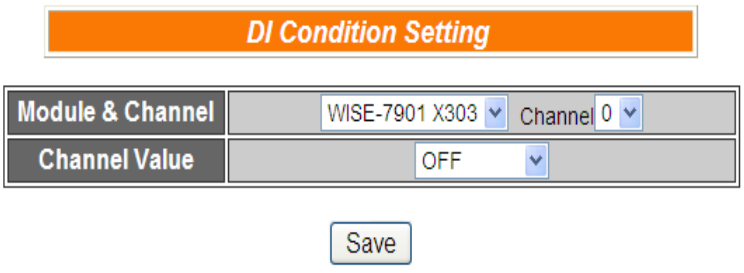


Figure 6-5：DI condition setting page

Follow the following steps:

i. Select the channel that you are going to use the value as evaluation criteria for IF condition statement. Specify the channel from the

dropdown list of channel field in “Module & Channel” section.

ii. Define the evaluation criteria of the status in IF statement to be “OFF” “ON” “ON to OFF” “OFF to ON” or “Change”. Once the DI channel value matches the evaluation criteria, the result of this condition evaluation will be “true”. Please note: If the statement involves state transitions: “ON to OFF”, “OFF to ON” and “Change”, the action will be executed only once and only at the moment when the state transition occurs.

iii. Click “Save” button to save the settings. This popup window will be closed and return to the Rule settings page.

6.1.3 DI Counter

DI counter value can be used as evaluation criteria for IF condition statement; the editing page for DI counter Condition Setting is shown as follow:

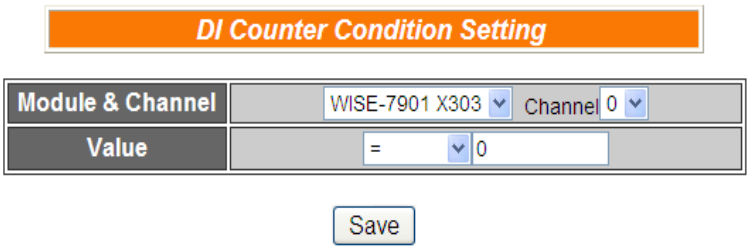


Figure 6-6：DI counter condition setting page

Follow the following steps:

i. Select the channel that you are going to use the value as evaluation criteria for IF condition statement. Specify the channel from the dropdown list of channel field in the “Module & Channel” section.

ii. Set up the expression statement for this counter value. Select an operator from “=”,”>”,”<”,”>=”,“<=” or “Change”. If the operator is “=”,”>”,”<”,”>=” or “<=”, an evaluation value has to be specified; if the DI counter value match the evaluation criteria, the result of this condition evaluation will be “true”. If the operator is “Change”, the condition will be “true” when there is a change to the counter value. The action will be executed only once and only at the moment when DO Counter experience a change.

iii. Click “Save” button to save the settings. This popup window will be closed and return to the Rule settings page.

6.1.4 DO Counter

DO counter value can be used as evaluation criteria for IF condition statement; the editing page for DO counter Condition Setting is shown as follow:

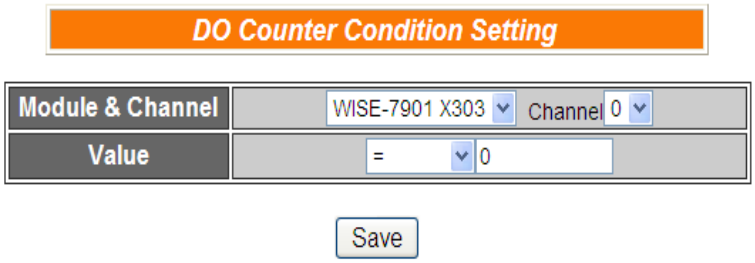


Figure 6-7：DO counter condition setting page

Follow the following steps:

i. Select the channel that you are going to use the value as evaluation criteria for IF condition statement. Specify the channel from the dropdown list of channel field in the “Module & Channel” section.

ii. Set up the expression statement for this counter value. Select an operator from “=”,”>”,”<”,”>=”,“<=” or “change”. If the operator is “=”,”>”,”<”,”>=” or “<=”, an evaluation value has to be specified; if this DO counter value match the evaluation criteria, the result of this condition evaluation will be “true”. If the operator is “Change”, the condition will be true when there is a change to the counter value. The action will be executed only once and only at the moment when DO Counter experience a change.

iii. Click “Save” button to save the settings. This popup window will be closed and return to the Rule settings page.

6.1.5 Internal Register

Internal Register value can be used as evaluation criteria for IF condition statement; the editing page for Internal Register Condition Setting is shown as follow:

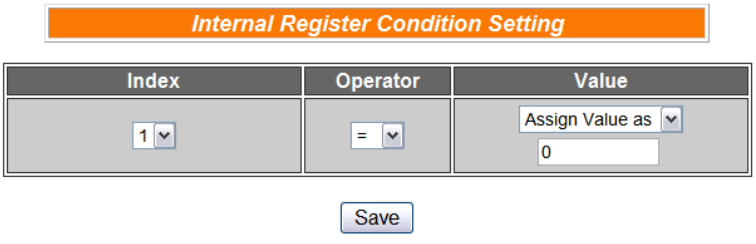


Figure 6-8：Internal register condition setting page

Follow the following steps:

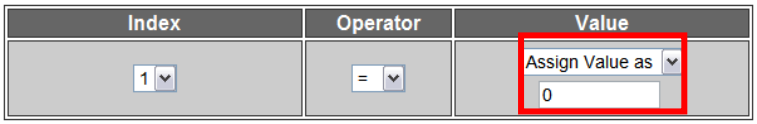
i. Select the Internal Register that you are going to use the value as evaluation criteria for IF condition statement. Specify the Internal Register Index from the dropdown list of “Index” field.

ii. Set up the expression statement for this Internal Register value. Select an operator from “=”,”>”,”<”,”>=” or “<=”.

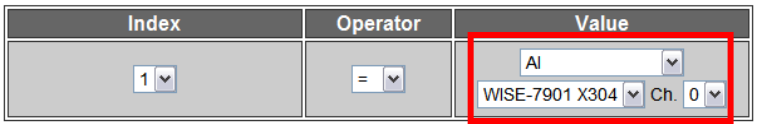
iii. Specify the evaluation value. If this Internal Register value match the evaluation criteria, the result of this condition evaluation will be “true”.

You can compare the Internal Register with the following 3 values for condition evaluation:

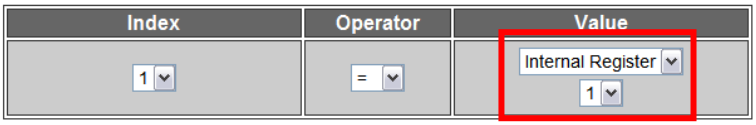
- Self-Defined value：Giving a self-defined value to compare with the Internal Register value.



- AI Channel value：Using AI channel values from the local module to compare with the Internal Register value.



- Internal Register：Using other internal register value to compare with the Internal Register value.



iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.1.6 Timer

Timer condition can be used as evaluation criteria for IF condition statement; the editing page for timer condition setting is shown as follow:

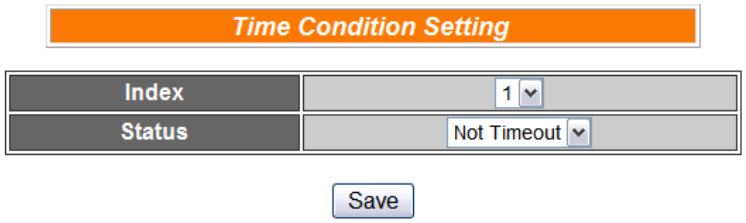


Figure 6-9：Timer condition setting page

Follow the following steps:

i. Select the timer that you are going to use its status as evaluation criteria for IF condition statement. Specify the timer index from the dropdown list of the “Index” field.
ii. Define the evaluation criteria of the timer status in IF statement to be “Not timeout” or “Timeout”. If the timer status match the evaluation criteria, the result of this condition evaluation will be “true”.
iii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.1.7 Schedule

Schedule condition can be used as evaluation criteria for IF condition statement; the editing page for Schedule condition Setting is shown as follow:

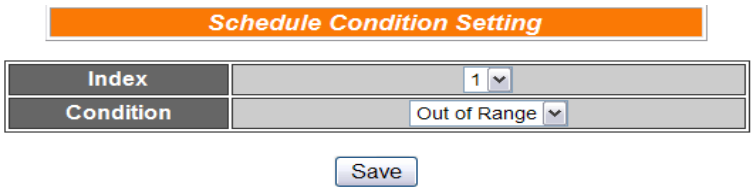


Figure 6-10：Schedule condition setting page

Follow the following steps:

i. Select the schedule that you are going to use its status as evaluation criteria for IF condition statement. Specify the schedule index from the dropdown list of the “Index” field.
ii. Define the evaluation criteria of the status in IF statement to be “Out of Range” or “In Range”. If the status of the schedule matches the evaluation criteria, the result of this condition evaluation will be “true”.
iii. Click “Save” button to save the settings. The popup window will closed and return to the rule settings page.

6.1.8 P2P

Through P2P function, the data (DI, AI, DI/DO Counter or Internal Register) from remote WISE controllers can be retrieved and can be incorporated into IF Condition statements. To set up P2P condition Setting, first of all, you will need to assign an index number and specify what data you are going to use in the IF condition statements. Secondly, you will need to set up detail settings for the Condition settings. The configuration page for setting up index and condition is shown as below:

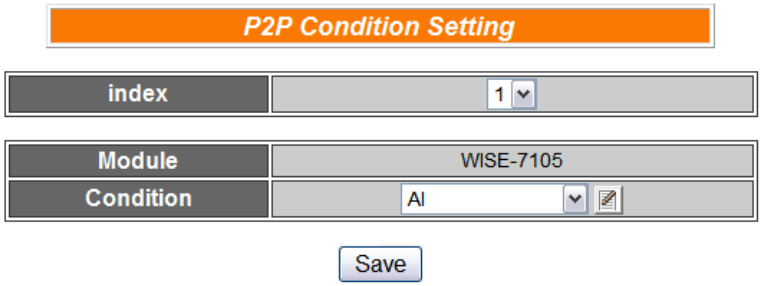


Figure 6-11：P2P IF Condition setting page

Follow the following steps:

i. Assign an index number to the P2P Condition Setting from the dropdown list of the “Index” field.
ii. Specify the data for use in the Condition statements from the dropdown list in the Condition field.
iii. Click on the button, a Condition setting page will appear for setting up detail information of the Condition settings. The configuration page for Condition settings is shown as below:

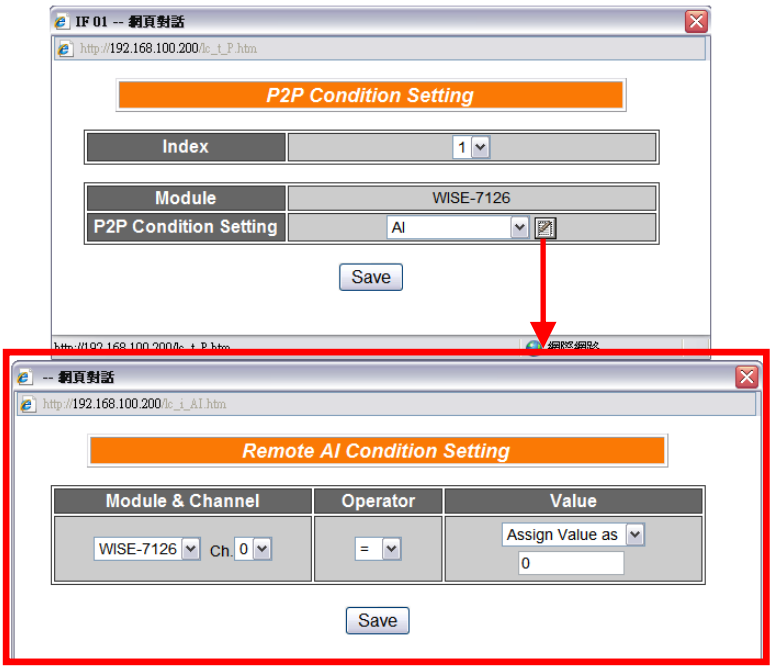


Figure 6-12：P2P IF Condition detail setting page

iv. For detail information of Condition Setting, please refer to IF Condition; sections regarding DI, AI, DI Counter, DO Counter, and Internal Register.

v. Click “Save” button to save the settings. The popup Condition Setting page will be closed and return to P2P Condition setting page.

vi. On the P2P Condition setting page, click “Save” button to save the settings. The P2P Condition setting page will be closed and return to the Rule Setting page.

6.1.9 Rule Status

The Rule Status (if the Rule is disabled or enabled) can be used as evaluation criteria for IF condition statement. Please note: there must be at least one edited rule on WISE controller for setting up Rule Status in the IF Condition Setting page. The editing page for Rule Status Condition Setting is shown as below:

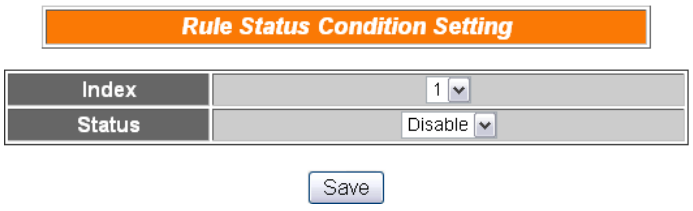


Figure 6-13：Rule Status IF Condition setting page

Follow the following steps:

i. Specify the index number of the Rule that is going to be used in the IF Condition statement from the dropdown list of the “Index” field.
ii. Specify the Rule status to be Disable or Enable from the dropdown list of the “Status” field. When the Rule status matches the specified status, the evaluation result will be “true”.
iii. Click “Save” button to save the settings. The Rule Status Condition Setting page will be closed and return to the Rule setting page.

6.2 THEN/ELSE Action

In the THEN/ELSE Action statement, the following values or status can be included:

- AO
- DO
- DI Counter
- DO Counter
- Internal Register
- Timer
- Schedule
- Email
- CGI
- Recipe
- P2P
- Rule Status

Select the component for Action statement from the combo box, and then click the right side button, a window will pop up for you to edit detail information. The THEN Action statement will be executed only when the result of IF condition statement is found “true”; otherwise the ELSE Action statement will be executed. In order to meet application requirement, for some Actions, WISE offers options to execute the Action one-time or repeatedly.

- One Time: when the IF Condition is TRUE, this Action will be executed once and only once. This Action will not be executed again until the IF Condition turns to be TRUE again.
- Repeat: when the IF Condition is TRUE, this Action will be executed repeatedly until the IF Condition turns to be FALSE.

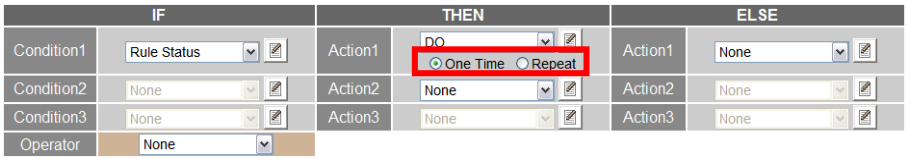


Figure 6-14：”One-Time Action” & ”Repeat Action” Items

6.2.1 AO

You can execute an action in AO channel in THEN/ELSE Action

statement; the editing page for AO Action is shown as follow:

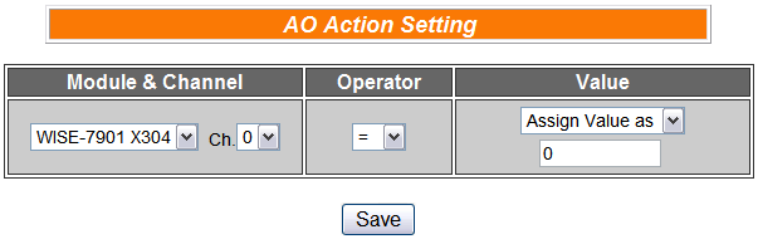


Figure 6-15：AO action page

Follow the following steps:

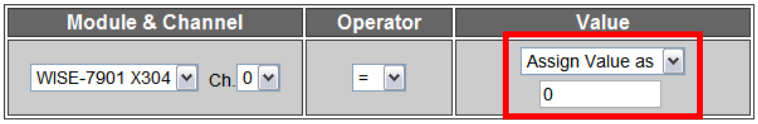
i. From the dropdown list of the “Module & Channel” field, select the AO channel index to execute actions.

ii. Specify the Operator in the “Operator” field. The 3 operators are as follow:

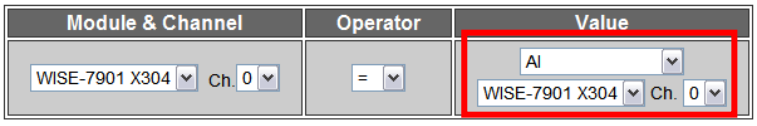
- “=”：Indicate assign the new AO channel value as the value in “Value” field.
- “+=”：Indicate assign the new AO channel value as the original AO channel value plus the value in “Value” field.
- “－=”：Indicate assign the new AO channel value as the original AO channel value minus the value in “Value” field.

iii. In the “Value” field, 4 sources can be used as value:

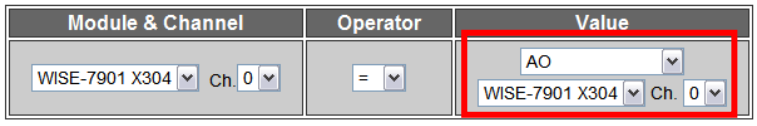
- Self-Defined Value: giving a value defined by user



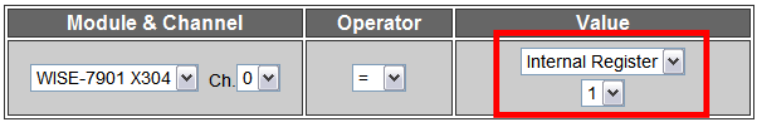
- AI Channel value: using AI channel values from the local module



- AO Channel value: using AO channel values from the local module



- Internal Register: using value of Internal Register



iv. Click “Save” button to save the settings. The popup window will be closed and will return to the rule setting page.

6.2.2 DO

You can execute an action in DO channel in the THEN/ELSE Action statement; the editing page for DO Action is shown as follow:

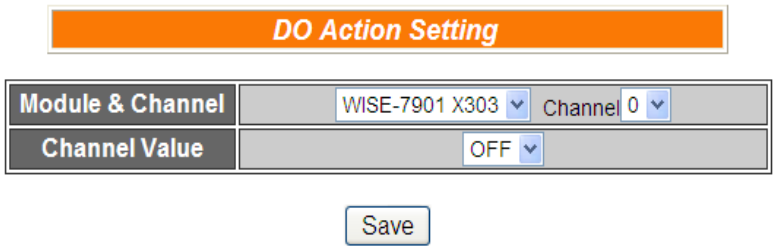


Figure 6-16：DO action page

Follow the following steps:

i. Select the DO channel to execute actions from the dropdown list of channel field in the “Module & Channel” section.
ii. Specify the output value of DO Channel from the dropdown list of the “Channel Value” field. The output value can be “OFF”, “ON” or “Pulse Output”. Please note: to make “Pulse Output” option available here, you have to enable “Pulse Output” in Advanced Setting before editing Rules Setting.
iii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.3 DI Counter

You can reset DI counter in the THEN/ELSE Action statement; the editing page for DI counter Action is shown as follow:

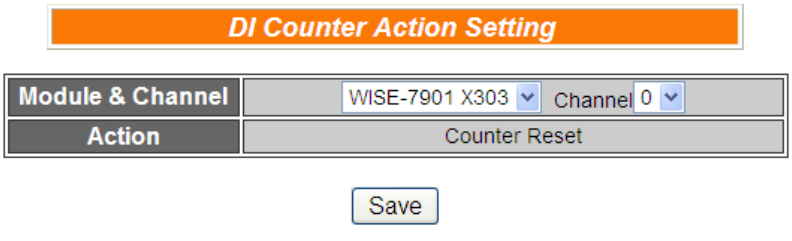


Figure 6-17：DI counter action page

Follow the following steps:

i. Select the DI channel to reset DI counter from the dropdown list of channel field in the “Module & Channel” section.

ii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.4 DO Counter

You can reset DO counter in THEN/ELSE Action statement; the editing page for DO counter Action is shown as below:

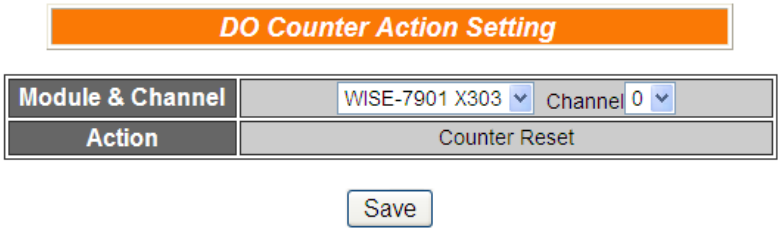


Figure 6-18：DO counter action page

Follow the following steps:

i. Select the DO channel to reset DO counter from the dropdown list of channel field in the “Module & Channel” section.
ii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.5 Internal Register

You can modify the value of Internal Register in the THEN/ELSE Action statement; the editing page for Internal Register Action Setting is shown as below:

Figure 6-19：Internal Register action page

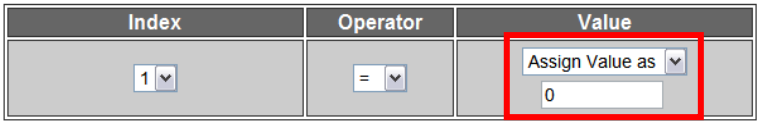
Follow the following steps:

i. Select the pre-defined Internal Register from the dropdown list of the “Index” field. Please note: the Internal Register you select has to be enabled in Advanced Setting.
ii. Specify the Operator in the “Operator” field. The 3 operators are as follow:
    - “=”：Indicate assign the new Internal Register value as the value in “Value” field.

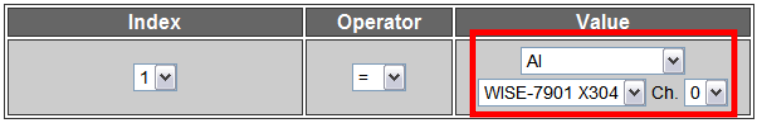
- “+=”：Indicate assign the new Internal Register value as the original Internal Register value plus the value in “Value” field.
- “—=”：Indicate assign the new Internal Register value as the original Internal Register value minus the value in “Value” field.

iii. In the “Value” field, 4 sources can be used as value:

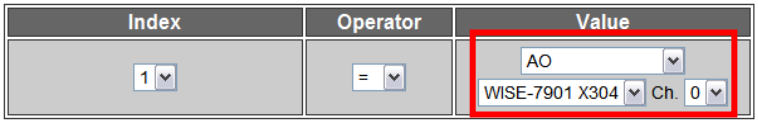
- Self-Defined Value: giving a value defined by user



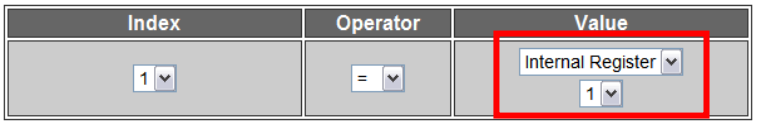
- AI Channel value: using AI channel values from the local module



- AO Channel value: using AO channel values from the local module



- Internal Register: using value of Internal Register



iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.6 Timer

You can change the Timer status (to stop or to start the Timer) in the THEN/ELSE Action statement; the editing page for Timer Action Setting is shown as below:

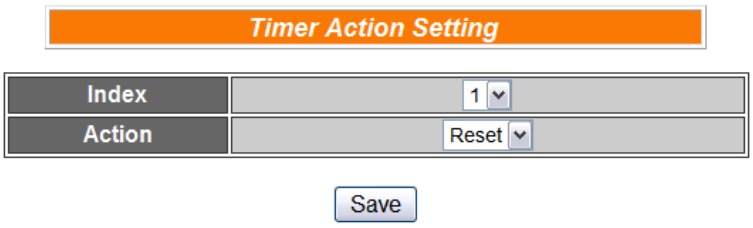


Figure 6-20：Timer action page

Follow the following steps:

i. Select the pre-defined Timer from the dropdown list of the “Index” field.
ii. Please note: the Timer you select has to be enabled in Advanced Setting.
iii. Specify you want to “Reset” or “Start” this Timer when this THEN/ELSE Action statement is executed.
iv. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.7 Schedule

You can change the Schedule status (to stop or to start the Schedule) in the THEN/ELSE Action statement; the editing page for Schedule Action Setting is shown as below:

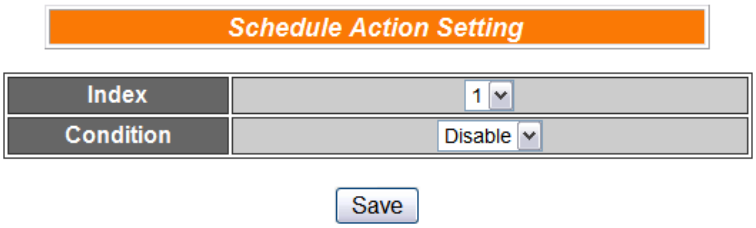


Figure 6-21：Schedule action setting

Follow the following steps:

i. Select the pre-defined Schedule from the dropdown list of the “Index” field. Please note: the Schedule you select has to be enabled in Advanced Setting.
ii. Specify you want to “Disable” or “Enable” this schedule when this THEN/ELSE Action statement is executed.
iii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.8 Email

You can send a message to an Email group when executing a THEN/ELSE Action statement; the editing page is as below:

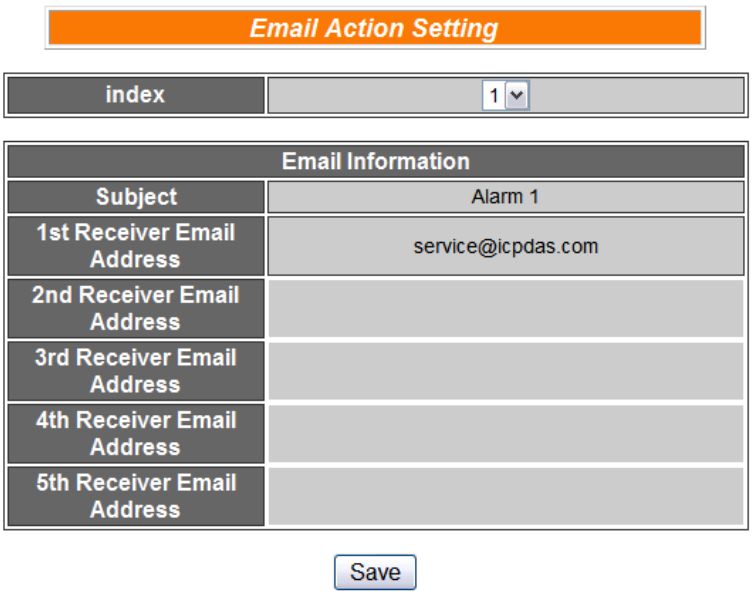


Figure 6-22：Email action page

Follow the following steps:

i. Select the pre-set Email group from the dropdown list of the "Index" field. The Email group information will be displayed for you to verify if this is the Email group you are going to send the message to.

ii. Click "Save" button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.9 CGI

You can send a CGI Command to a Remote Server when executing a THEN/ELSE Action statement; the editing page is shown as below:

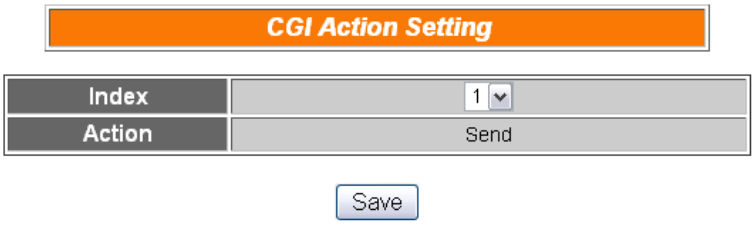


Figure 6-23：CGI Command action page

Follow the following steps:

i. Select the pre-set CGI Command action from the dropdown list of the "Index" field. Please note: the CGI Command Index you select has to be enabled in Advanced Setting.

ii. Click "Save" button to save the settings. The popup window will

be closed and return to the Rule settings page.

6.2.10 Recipe

You can execute a Recipe action in THEN/ELSE Action statement; the editing page for Recipe Action is shown as follow:

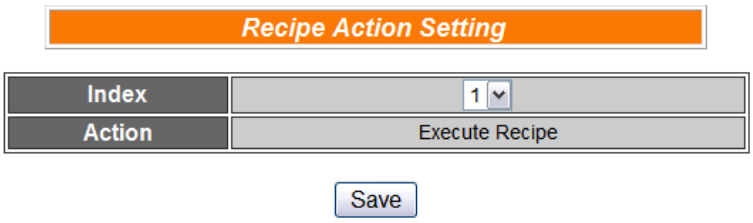


Figure 6-24：Recipe action page

Follow the following steps:

i. Select the pre-set Recipe action from the dropdown list of the “Index” field. Please note: the Recipe Index you select has to be enabled in Advanced Setting.

ii. Click “Save” button to save the settings. The popup window will be closed and return to the Rule settings page.

6.2.11 P2P

Through P2P function, the data (DO, AO or Internal Register) from remote WISE controllers can be incorporated into THEN/ELSE Action statements. To set up P2P Action Setting, first of all, you will need to assign an index number and specify what data you are going to use in the Action statements. Secondly, you will need to set up detail settings for the Action settings. The configuration page for setting up index and Action is shown as below:

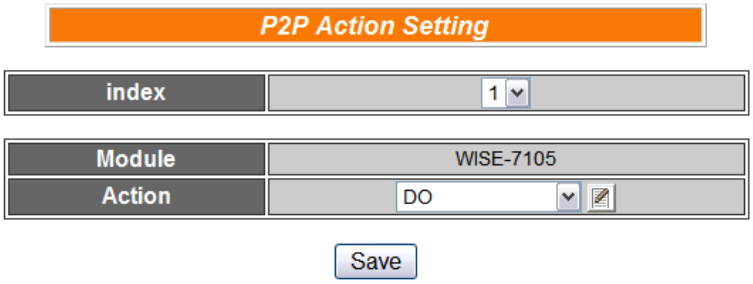


Figure 6-25：P2P action page

Follow the following steps:

i. Assign an index number to the P2P Action Setting from the dropdown list of the “Index” field.

ii. Specify the data for use in the Action statements from the dropdown list in the Action field.

iii. Click on the button, an Action setting page will appear for setting up detail information of the Action settings. The configuration page for Action settings is shown as below:

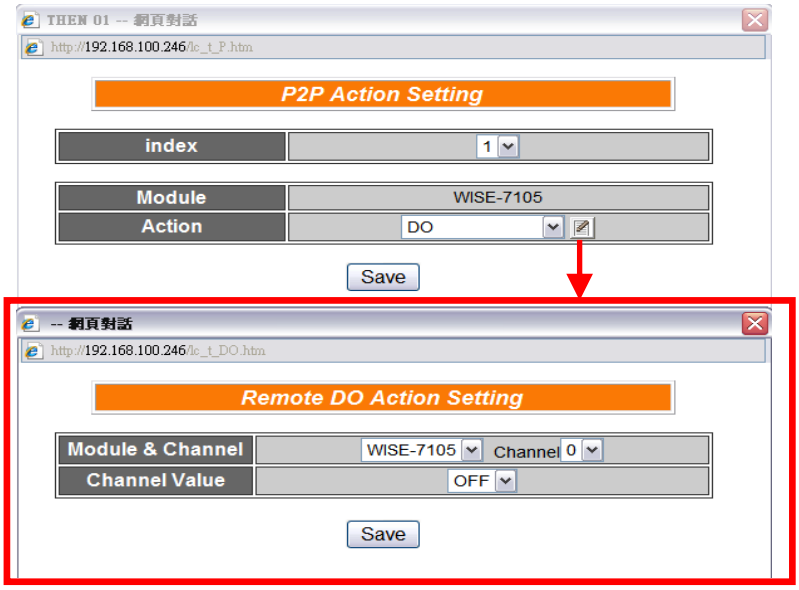


Figure 6-26：P2P action detail setting page

iv. For detail information of Action Setting, please refer to THEN/ELSE Action; sections regarding DO, AO, and Internal Register. Please note: The operators "+=" and "-=" are not supported in the AO and Internal Register Actions of P2P.

v. Click "Save" button to save the settings. The popup Action Setting page will be closed and return to P2P Action

vi. On the P2P Action setting page, click "Save" button to save the settings. The P2P Action setting page will be closed and return to the Rule Setting page.

6.2.12 Rule Status

The Rule Status can be modified to be Disable or Enable in the Action. The editing page for Rule Status Action Setting is shown as below:

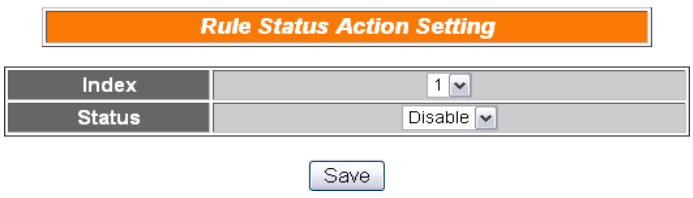


Figure 6-27：Rule Status action page

Follow the following steps:

i. Specify the index number of the Rule (It has to be a previously saved Rule) that is going to be changed in the Action Condition statement from the dropdown list of the “Index” field.
ii. Specify the Rule status to be Disable or Enable from the dropdown list of the “Status” field. When the Action being executed, the Rule status will be changed to specified status.
iii. Click “Save” button to save the settings. The Rule Status Action Setting page will be closed and return to the Rule setting page.

6.3 Summary of the Rules

After you finish editing all IF condition and THEN / ELSE action statements for a rule, return to the Rules Setting page and click “Save” to save all settings of this rule. Please note: if you want to clear previous settings, after you click “Clear” button, you have to click “Save” to make sure this “Clear” status is saved. Rules Setting page is shown as below:

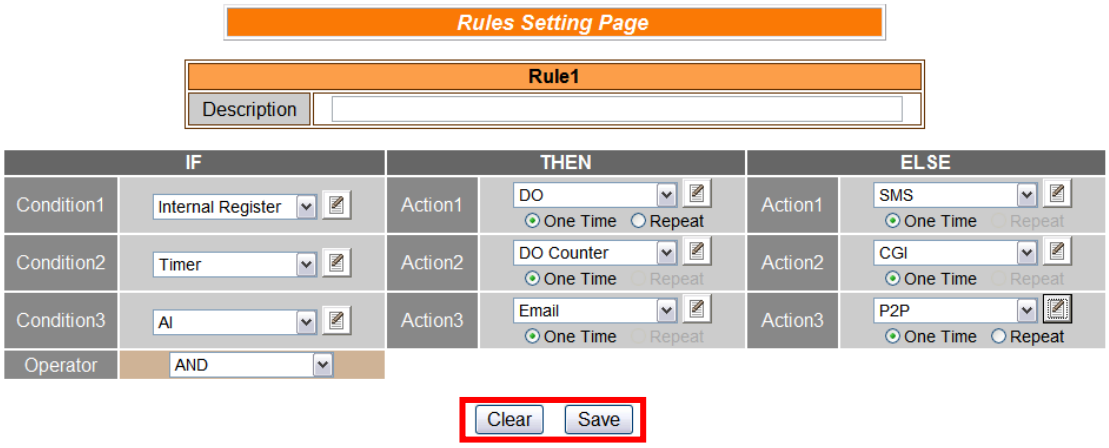


Figure 6-28：Clear/Save Rules

Each time you finish editing a Rule will go back to the Rules Setting main page. All statements of edited Rules will be displayed. Rules Setting main page is shown as below:

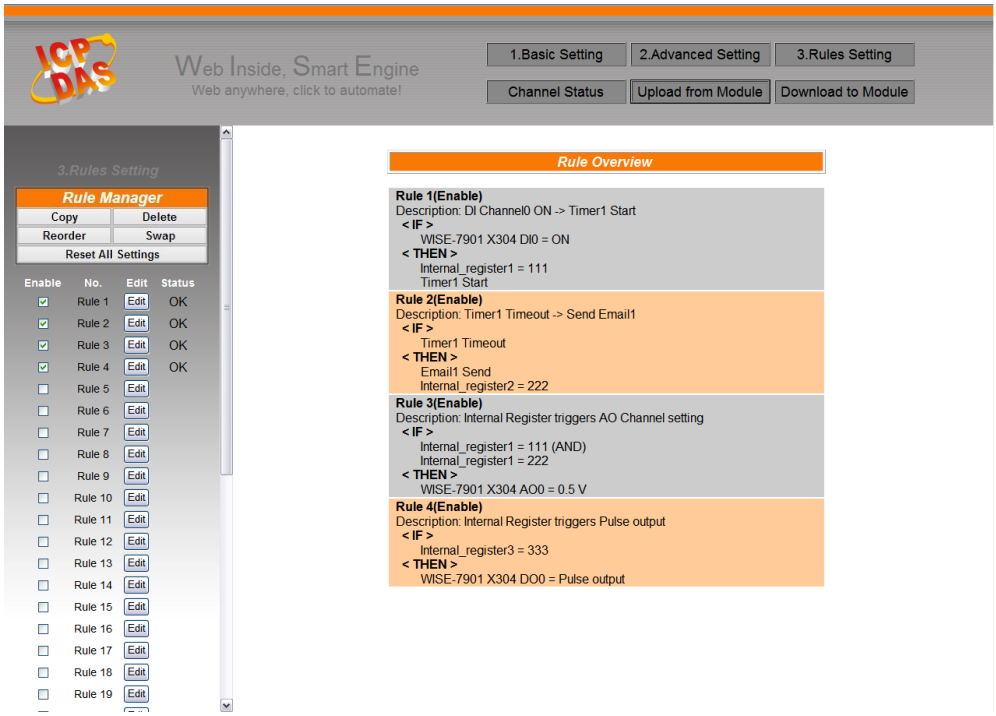


Figure 6-29：Rule setting main page

Click “Rules Setting” button to display detail rules description. Rules can be downloaded to the hardware device immediately after you successfully set up one or more rule(s).

6.4 Rule Manager

The Rule Manager allows easy modification and deployment with existing rules. By a few simple steps, users can easily change the rule orders or make modification with previously edited rules. The Rule Manager table is shown as below:

Figure 6-30：Rule Manager setting page

Rule Manager offers 5 functions:

- **Copy**: Copy the content of previously edited rule to another rule. Click "Copy" button, a window as shown below will pop up:

Figure 6-31：Rule Copy setting page

Select the source rule from the first field, and then select the destination(s) from the second fields (multiple rule destinations is allowed). Click "Save" button to copy the content of the source rule to all destination rules.

- **Reset**: allows to clear rule content of previously edited rules. Click "Reset" button, a window as shown below will pop up:

Figure 6-32：Rule Reset setting page

Rules that are previously edited will be listed on the page, select the rule to be cleared and then click "Save" button, the rule you select will be reset.

- **Reorder**: reorder existing rules. Click "Reorder" button, a window as shown below will pop up:

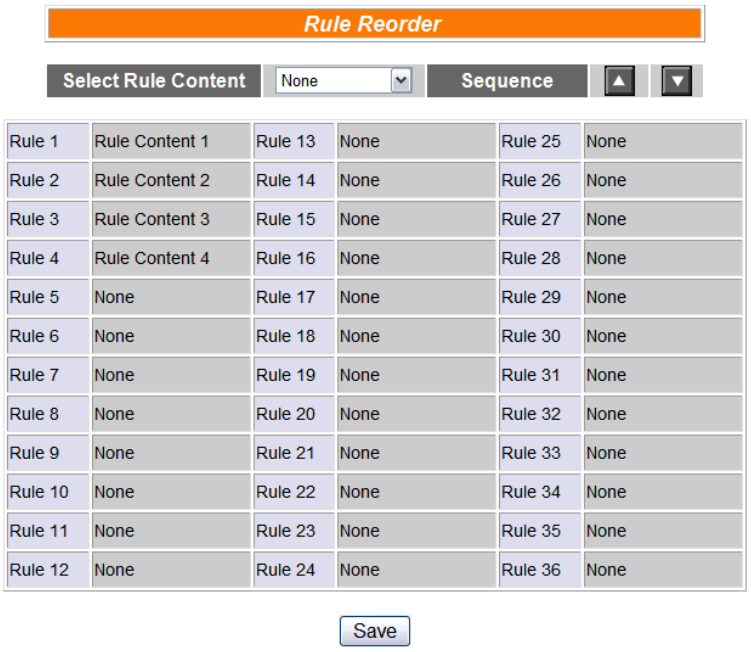

Rule Reorder
Select Rule Content
None
Sequence
Rule 1 Rule Content 1 Rule 13 None Rule 25 None
Rule 2 Rule Content 2 Rule 14 None Rule 26 None
Rule 3 Rule Content 3 Rule 15 None Rule 27 None
Rule 4 Rule Content 4 Rule 16 None Rule 28 None
Rule 5 None Rule 17 None Rule 29 None
Rule 6 None Rule 18 None Rule 30 None
Rule 7 None Rule 19 None Rule 31 None
Rule 8 None Rule 20 None Rule 32 None
Rule 9 None Rule 21 None Rule 33 None
Rule 10 None Rule 22 None Rule 34 None
Rule 11 None Rule 23 None Rule 35 None
Rule 12 None Rule 24 None Rule 36 None
Save

Figure 6-33：Rule Reorder setting page

A menu will appear at the top of the page, it contains a drop down list for selecting the target rule, and a pair of "Move Up"/"Move Down" buttons to move target rule to the desired location. All rule locations will be listed in sequence (currently support 36 rule locations). If the rule content of a specific rule location has been previously edited, "Rule Content X" (X : rule sequence index) will appear. If the rule content of the rule location is blank, it will be specified as "None". To reorder a rule, select the target rule from the dropdown list, the corresponding "Rule content X" font will

turn to blue from its usual black. Click on “Move Up”/“Move Down” buttons to move the selected rule to the desired location and then click “Save” to save the settings.

- **Swap**: Exchange the Rule content of a pair of rules. Click Swap button, a window as shown below will pop up:

Figure 6-34：Rule Swap setting page

From the left side drop down list, select the first rule (has to be previously edited), and select the second rule from the right side drop down list (the rule content can be blank), click “Save” to swap the rule content.

- **Reset All Settings**: Reset all settings and rules already done in “Basic Setting” page, “Advanced Setting” page and “Rule Setting” page. This function is used for the requirement to restart all setting of the controller. If you just want to reset all rules, you can use the “Reset” function in Rule Manager. After you click the “Reset All Settings” button inadvertently to reset all rules and settings, you can still retrieve all settings and rules from the controller and edit them again by pressing the “Upload from Module” button.

7 Download to Module

Download button allows you to download edited rules from Web UI to hardware devices. Click the “Download to Module” button, the download process will be started. Current download progress will be displayed as below:

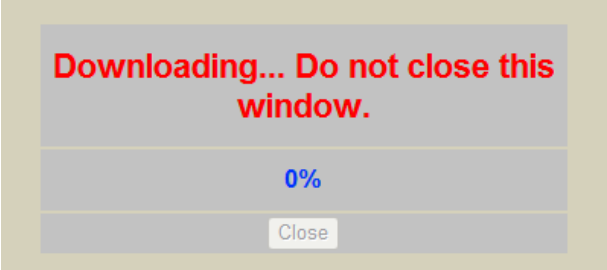


Figure 7-1：Showing download progress

When the download process is finished, the popup window will notify the user the saving process is completed:

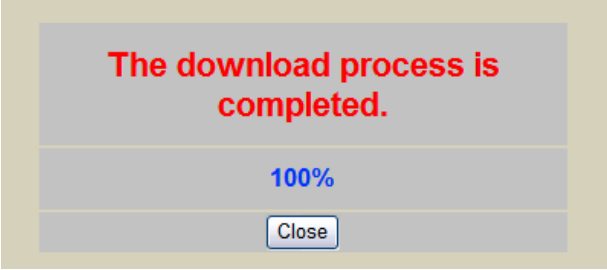


Figure 7-2：Message showing a successful download

Close the popup window and go back to the Rules Setting window. About 3 seconds after the download is completed, the hardware device will automatically reboot and start to run the rules that have been downloaded. At this time, you can still edit or modify the content of the rules.

8 Upload from Module

Upload button allows you to retrieve Rules Setting information from the hardware devices and edit them at this Rules Setting page. Click “Upload from Module” to start the upload process. When the upload process is finished, the window showing progress status will notify the user the process is completed:

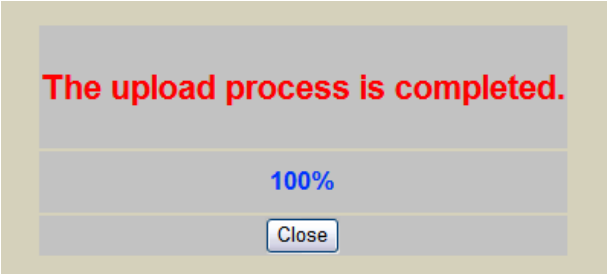


Figure 8-1：Message showing a successful upload

Click “close” to close the upload process window to finish upload. Now the rules have been uploaded from hardware devices to the web page, you can modify and download the edited rules to the hardware devices later again.

9 Channel Status

Channel Status function offers an easy to view monitoring page that allows users to view important controller information in real time without SCADA software. The Channel Status page is shown as below:

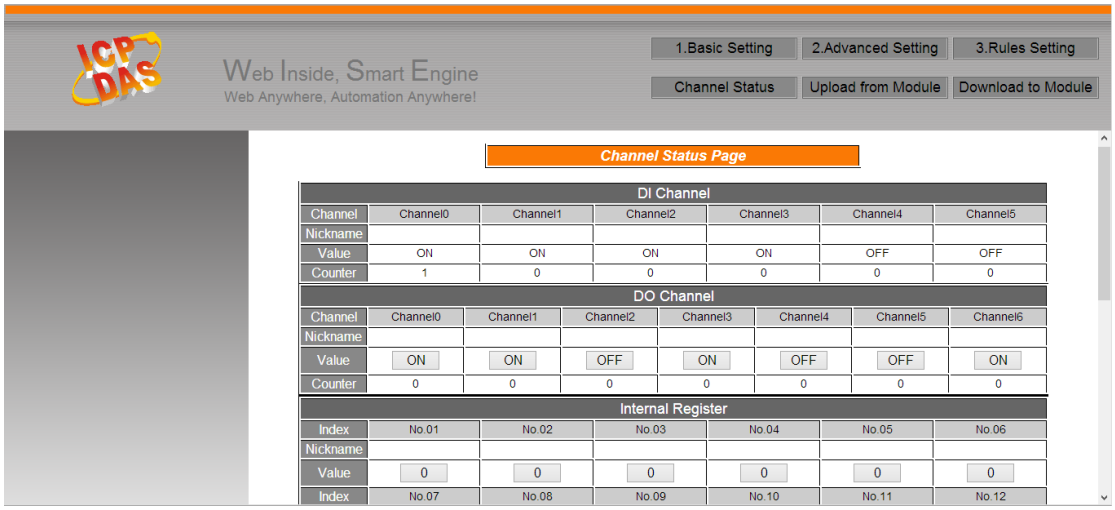

Web Inside, Smart Engine
Web Anywhere, Automation Anywhere!
1.Basic Setting
2.Advanced Setting
3.Rules Setting
Channel Status
Upload from Module
Download to Module
Channel Status Page
DI Channel
Channel Channel0 Channel1 Channel2 Channel3 Channel4 Channel5
Nickname
Value ON ON ON ON OFF OFF
Counter 1 0 0 0 0 0
DO Channel
Channel Channel0 Channel1 Channel2 Channel3 Channel4 Channel5 Channel6
Nickname
Value ON ON OFF ON OFF OFF ON
Counter 0 0 0 0 0 0 0
Internal Register
Index No.01 No.02 No.03 No.04 No.05 No.06
Nickname
Value 0 0 0 0 0 0
Index No.07 No.08 No.09 No.10 No.11 No.12

Figure 9-1：Channel Status page

The Channel Status page will show the values of DI / DO / AI / AO channel, DI/DO counter, and the Internal Register. If you give nicknames to the I/O channels or Internal Registers, the nicknames will be shown on this page as well. You can modify the values of the DO/AO/IR channels with the value buttons on this page. This page will be updated once every 10 seconds, showing the latest data of the controllers.

10 LED Functions

Each WISE-7901D controller equips with a 5 Digit 7-segment LED display that will display network information and channel values in sequence. The information is displayed as below:

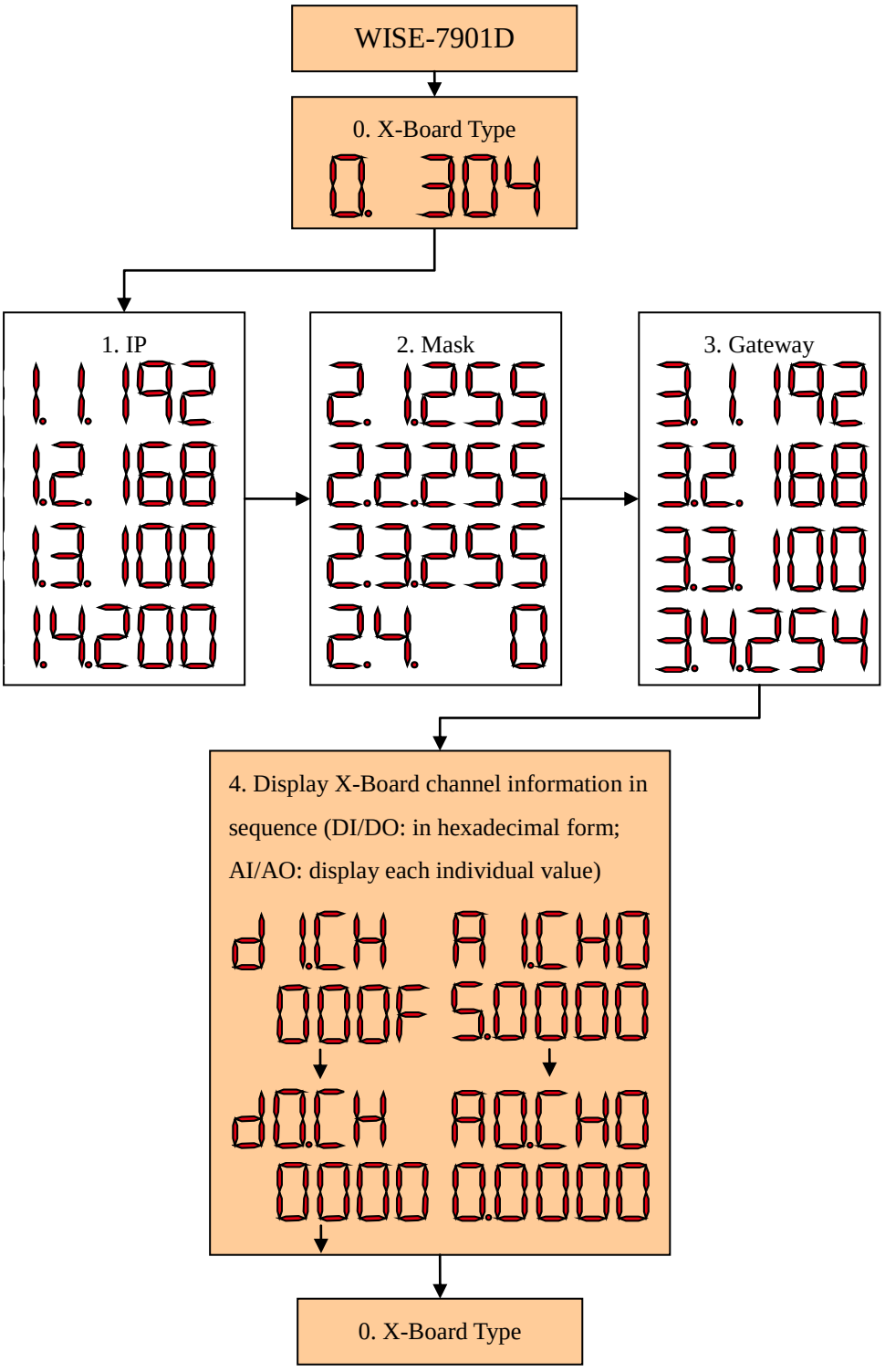


Figure 10-1：The LED display shows network information and channel values

11 Firmware Update

11.1 Introduction

WISE Firmware Uploader is a software tool provides a user friendly interface to easily update WISE firmware that runs on WISE hardware devices. With a few clicks, users could upload the latest WISE firmware to the hardware.

System Requirements:

- Operating System: Windows Server 2003, Windows Server 2008, Windows Vista, Windows XP.
- Make sure you have installed Microsoft .NET Framework Version 2.0 (or later)
  - You can download Microsoft .Net Framework Version 2.0 from the link below:
    http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&DisplayLang=en
  - You can download Microsoft .Net Framework Version 3.5 from the link below:
    http://www.microsoft.com/downloads/details.aspx?familyid=333325FD-AE52-4E35-B531-508D977D32A6&displaylang=en

11.2 Install / Uninstall WISE Firmware Uploader

11.2.1 Install WISE Firmware Uploader

Follow the steps below to install WISE Firmware Uploader:

- Obtain the WISE Firmware Uploader setup file (WISE Firmware Uploader Setup V2.0.exe).
- Double click the setup file to install the file, you will see a window pop up as below, click [Next] to continue.

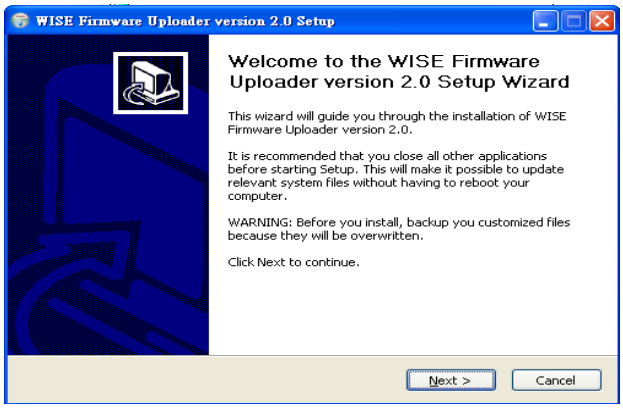

WISE Firmware Uploader version 2.0 Setup
Welcome to the WISE Firmware Uploader version 2.0 Setup Wizard
This wizard will guide you through the installation of WISE Firmware Uploader version 2.0.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
WARNING: Before you install, backup you customized files because they will be overwritten.
Click Next to continue.
Next >
Cancel

Figure 11-1：Install WISE Firmware Uploader

- Choose the installation location to install WISE Firmware Uploader. Click [Install] to start the installation.

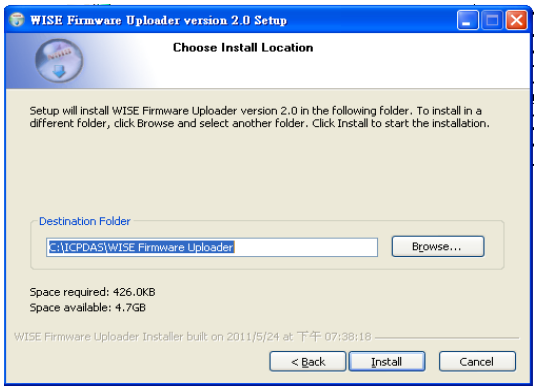

WISE Firmware Uploader version 2.0 Setup
Choose Install Location
Setup will install WISE Firmware Uploader version 2.0 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder
C:\ICPDAS\WISE Firmware Uploader
Browse...
Space required: 426.0KB
Space available: 4.7GB
WISE Firmware Uploader Installer built on 2011/5/24 at 下午 07:38:18
< Back
Install
Cancel

Figure 11-2：Select installation directory

- The installation progress will be shown as below; please wait till the installation is completed.

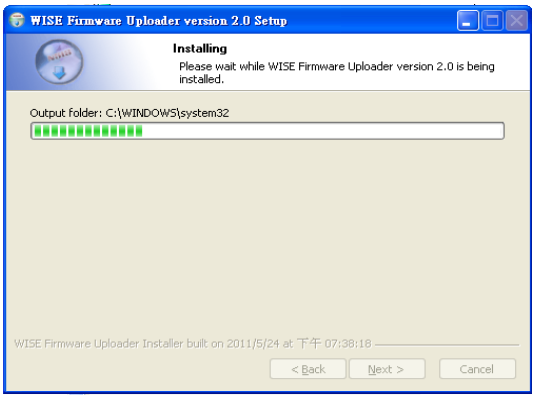

WISE Firmware Uploader version 2.0 Setup
Installing
Please wait while WISE Firmware Uploader version 2.0 is being installed.
Output folder: C:\WINDOWS\system32
WISE Firmware Uploader Installer built on 2011/5/24 at 下午 07:38:18
< Back
Next >
Cancel

Figure 11-3：Display installation progress

- When the installation is completed, click [Finish] to close the process.

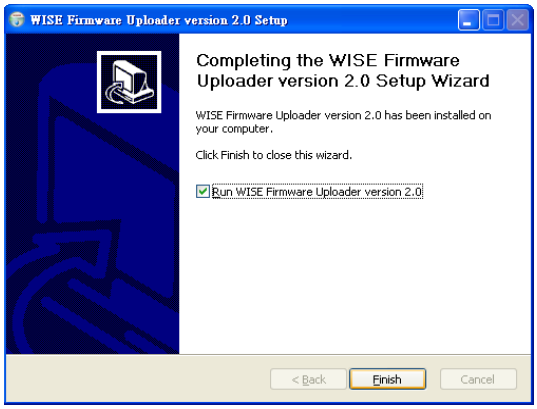

WISE Firmware Uploader version 2.0 Setup
Completing the WISE Firmware Uploader version 2.0 Setup Wizard
WISE Firmware Uploader version 2.0 has been installed on your computer.
Click Finish to close this wizard.
Run WISE Firmware Uploader version 2.0
< Back
Finish
Cancel

Figure 11-4：Complete the installation

11.2.2 Uninstall WISE Firmware Uploader

Follow the steps below to uninstall WISE Firmware Uploader:

- Click [Start]→ [All Programs]→[ICPDAS]→[WISE], and then click [Uninstall] under the [WISE] category.

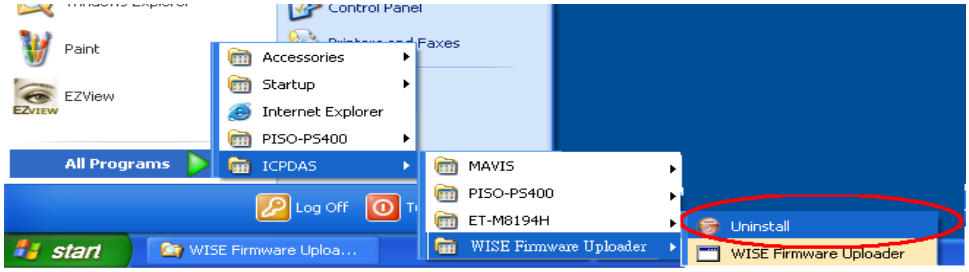


Figure 11-5：Start to remove WISE Firmware Uploader

- You will see a window pop up as below, click [Next] to continue.

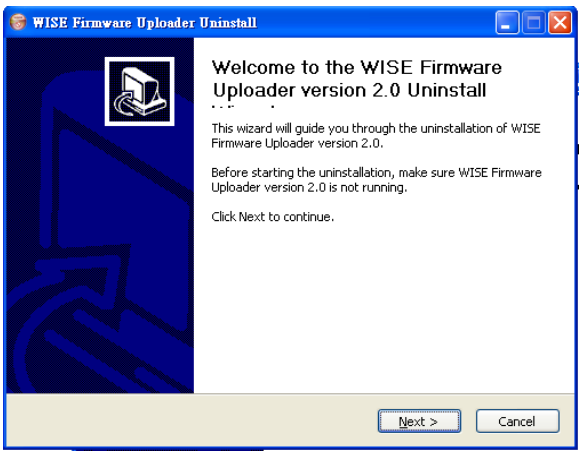

WISE Firmware Uploader Uninstall
Welcome to the WISE Firmware Uploader version 2.0 Uninstall
This wizard will guide you through the uninstallation of WISE Firmware Uploader version 2.0.
Before starting the uninstallation, make sure WISE Firmware Uploader version 2.0 is not running.
Click Next to continue.
Next >
Cancel

Figure 11-6：Remove WISE Firmware Uploader (1)

- Click [Uninstall] to uninstall the program.

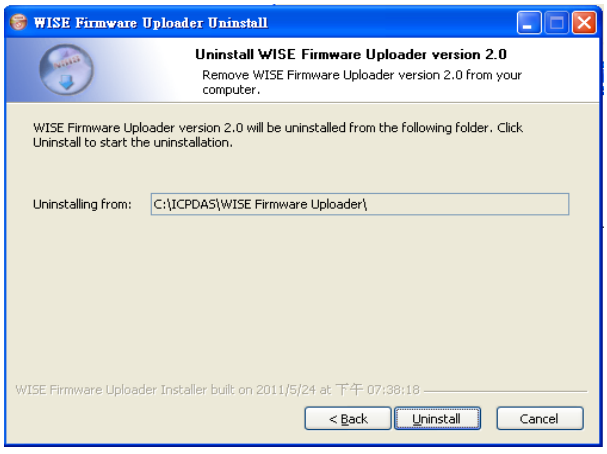

WISE Firmware Uploader Uninstall
Uninstall WISE Firmware Uploader version 2.0
Remove WISE Firmware Uploader version 2.0 from your computer.
WISE Firmware Uploader version 2.0 will be uninstalled from the following folder. Click Uninstall to start the uninstallation.
Uninstalling from:
C:\ICPDAS\WISE Firmware Uploader\
WISE Firmware Uploader Installer built on 2011/5/24 at 下午 07:38:18
< Back
Uninstall
Cancel

Figure 11-7：Remove WISE Firmware Uploader (2)

- When the uninstall process is completed, click [Finish] to finish the uninstallation.

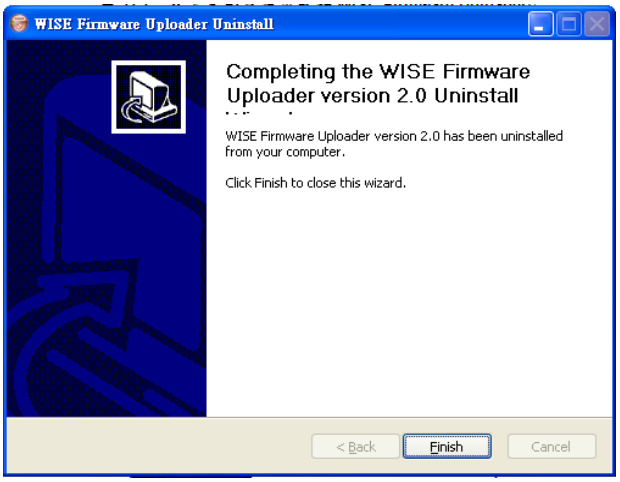

WISE Firmware Uploader Uninstall
Completing the WISE Firmware Uploader version 2.0 Uninstall
WISE Firmware Uploader version 2.0 has been uninstalled from your computer.
Click Finish to close this wizard.
< Back
Finish
Cancel

Figure 11-8：Complete uninstalling WISE Firmware Uploader

11.3 Update WISE firmware

Please follow the six steps below to update the WISE firmware program on the hardware devices:

11.3.1 Before update

- Please visit WISE product web site (http://wise.icpdas.com/) or contact ICP DAS service to obtain the latest version of the WISE firmware program. Copy the file to the computer that you previously installed WISE Firmware Uploader.
- Connect the hardware device that you are going to update WISE firmware to the network. Please verify and make a note of the hardware device IP address, you will need it later in the process.

11.3.2 Execute WISE Firmware Uploader

- Taking Windows XP as an example: click [Start]→[All Programs]→[ICPDAS]→[WISE], and then click [WISE Firmware Uploader] under the [WISE] category to start the program.

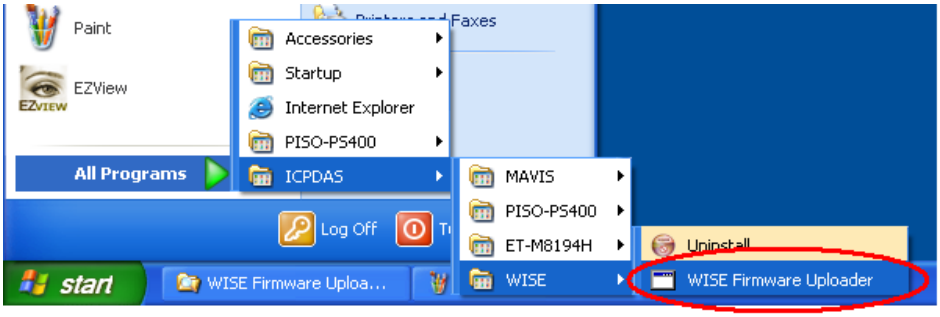


Figure 11-9：Launch WISE Firmware Uploader

11.3.3 Select WISE module type

Select the WISE module type from the dropdown list. Make sure the module type is ”WISE 4000, 71xx & 790x Series”, as shown in the following figure.

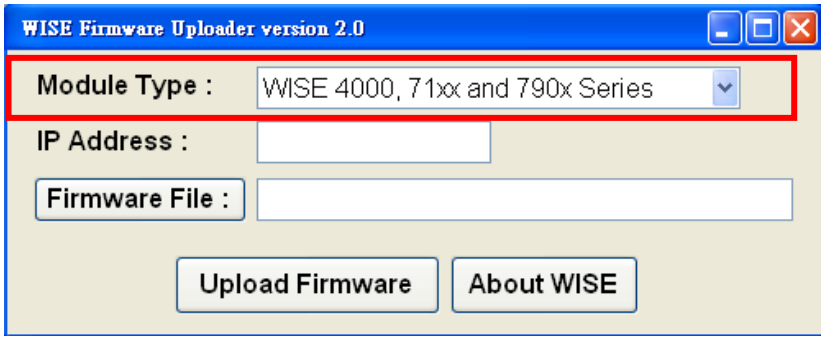


Figure 11-10：Select the WISE module type

11.3.4 Set up Hardware IP

Enter the IP address of the hardware device that you are going to update WISE firmware, as shown in the following figure.

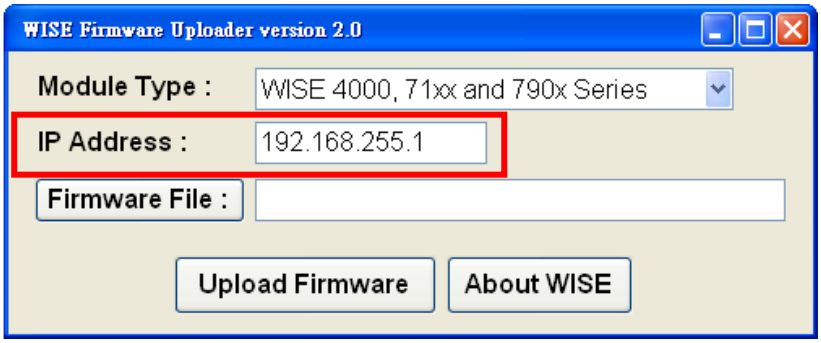


Figure 11-11：Assign IP address

11.3.5 Select WISE firmware file

Click “Firmware File” button; browse the file through the File Dialog Box to select the appropriate WISE firmware version. As shown in the following figure:

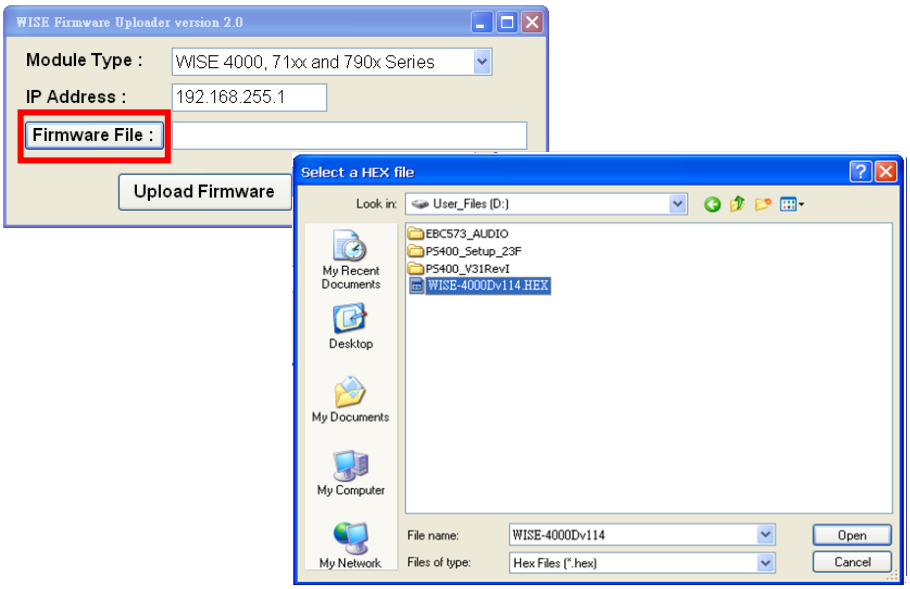


Figure 11-12：Select the WISE firmware

11.3.6 Upload WISE firmware program

Click ”Upload Firmware” button to start update WISE firmware to the hardware device.

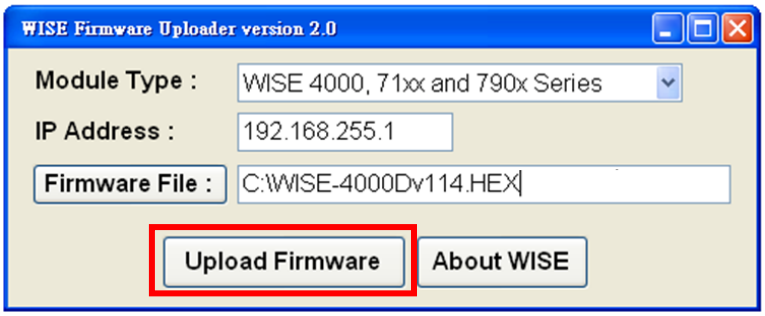


Figure 11-13：Upload firmware

The status of WISE firmware update progress will be shown as below:

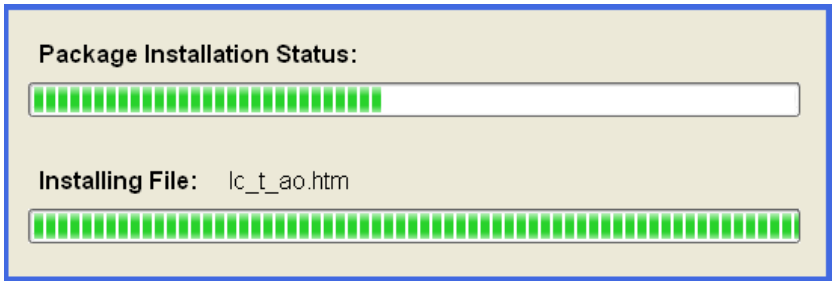


Figure 11-14：Display firmware update progress

When completing update of the WISE firmware, a pop-up window will appear to inform the user. Close the window to finish firmware upload.

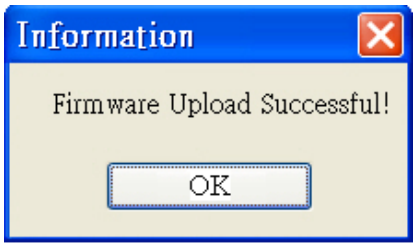


Figure 11-15：Complete firmware update

11.3.7 Module reboot automatically

After complete the firmware update process, WISE module will automatically reboot. The new updated firmware will take effect after the reboot.

Appendix I：Modbus Address Table

WISE allows you to retrieve data on hardware devices via Modbus TCP.

Please Note :

- The addresses are in **Base 0** format
- The addresses are listed in **Decimal** format
- The **default value of NetID is 1**, and you can modify the NetID value in the Ethernet Setting page. (Please refer to 4.3 Ethernet Setting).
- The **default value of Port is 502**, and you can modify the Port value in the Ethernet Setting page. (Please refer to 4.3 Ethernet Setting).
- If the data is displayed in Floating format (AI channel value, AO channel value or Internal Register, etc.), each record of data will take two registers to hold the data. The following code example demonstrates how to join the two registers into one floating point value.

```
float register_to_float(short r1, short r2)
{
    float f;
    int *a = &f;
    *a = r1;
    a++;
    *a = r2;
    return f;
}
```

Please note: for the compilers are different (big endian or little endian), the floating point composing order might be different. For example: if r1 represent the address of 30040 register and r2 represent the address of 30041 register, to join r1 and r2 to a floating point, in the system is big endian system you will need to call:

```
float value = register_to_float(r1, r2);
```

Instead, if the system is little endian system, you will need to call:

```
float value = register_to_float(r2, r1);
```

PS: if you are not sure your editor belongs to which system, try both systems to find the accurate one.

1. System Data

The following table lists the Modbus address of WISE-790x system information:

Parameter Name	Modbus Address	Length	Data Type	Range
Coils Output, Unit : Coil(8 Bits)				
Reboot switch	00000	1	Byte	1=reboot
Input Register, Unit : Register(16 Bits)				
Module Name	30000	1	Int	0~65535
XBoard Name	30001	1	Int	0~65535
Firmware Version	30002	2	Float	Floating Point
Alive Counter	30004	1	Int	0~65535
Cycle Time	30005	1	Int	0~65535
MAC Address 1	30006	1	Int	0~255
MAC Address 2	30007	1	Int	0~255
MAC Address 3	30008	1	Int	0~255
MAC Address 4	30009	1	Int	0~255
MAC Address 5	30010	1	Int	0~255
MAC Address 6	30011	1	Int	0~255
Web Port	30012	1	Int	1~65535
Modbus TCP NetID	30013	1	Int	1~255
Modbus TCP Port	30014	1	Int	1~65535
Holding Register, Unit : Register(16 Bits)				
Ethernet IP 1	40000	1	Int	0~255
Ethernet IP 2	40001	1	Int	0~255
Ethernet IP 3	40002	1	Int	0~255
Ethernet IP 4	40003	1	Int	0~255
Subnet Mask 1	40004	1	Int	0~255
Subnet Mask 2	40005	1	Int	0~255
Subnet Mask 3	40006	1	Int	0~255
Subnet Mask 4	40007	1	Int	0~255
Gateway 1	40008	1	Int	0~255
Gateway 2	40009	1	Int	0~255
Gateway 3	40010	1	Int	0~255
Gateway 4	40011	1	Int	0~255

2. Channel Data

According to the X-Board modules supported by WISE-790x, the Modbus Address for each module channel are listed in the following Modbus address table:

◆ **X-Board (Maximum 14 DI、13 DO、7 AI、4 AO channel)**

According to the channel numbers of X-Board, you can look up the address of the X-Board channels from the following table:

Parameter Name	Modbus Address	Length	Data Type	Range
Coils Outputs, Unit : Coil(8 Bits)				
DO Ch.0	00020	1	Byte	0=OFF, 1=ON
DO Ch.1	00021	1	Byte	0=OFF, 1=ON
DO Ch.2	00022	1	Byte	0=OFF, 1=ON
DO Ch.3	00023	1	Byte	0=OFF, 1=ON
DO Ch.4	00024	1	Byte	0=OFF, 1=ON
DO Ch.5	00025	1	Byte	0=OFF, 1=ON
DO Ch.6	00026	1	Byte	0=OFF, 1=ON
DO Ch.7	00027	1	Byte	0=OFF, 1=ON
DO Ch.8	00028	1	Byte	0=OFF, 1=ON
DO Ch.9	00029	1	Byte	0=OFF, 1=ON
DO Ch.10	00030	1	Byte	0=OFF, 1=ON
DO Ch.11	00031	1	Byte	0=OFF, 1=ON
DO Ch.12	00032	1	Byte	0=OFF, 1=ON
Discrete Inputs, Unit : Discrete Input (8 Bits)				
DI Ch.0	10020	1	Byte	0=OFF, 1=ON
DI Ch.1	10021	1	Byte	0=OFF, 1=ON
DI Ch.2	10022	1	Byte	0=OFF, 1=ON
DI Ch.3	10023	1	Byte	0=OFF, 1=ON
DI Ch.4	10024	1	Byte	0=OFF, 1=ON
DI Ch.5	10025	1	Byte	0=OFF, 1=ON
DI Ch.6	10026	1	Byte	0=OFF, 1=ON
DI Ch.7	10027	1	Byte	0=OFF, 1=ON
DI Ch.8	10028	1	Byte	0=OFF, 1=ON
DI Ch.9	10029	1	Byte	0=OFF, 1=ON
DI Ch.10	10030	1	Byte	0=OFF, 1=ON
DI Ch.11	10031	1	Byte	0=OFF, 1=ON
DI Ch.12	10032	1	Byte	0=OFF, 1=ON

DI Ch.13	10033	1	Byte	0=OFF, 1=ON
Input Register, Unit :Register(16 Bits)				
AI Ch.0	30020	2	Float	By Channel Type Setting
AI Ch.1	30022	2	Float	By Channel Type Setting
AI Ch.2	30024	2	Float	By Channel Type Setting
AI Ch.3	30026	2	Float	By Channel Type Setting
AI Ch.4	30028	2	Float	By Channel Type Setting
AI Ch.5	30030	2	Float	By Channel Type Setting
AI Ch.6	30032	2	Float	By Channel Type Setting
DI Counter 0	30060	1	Int	0~65535
DI Counter 1	30061	1	Int	0~65535
DI Counter 2	30062	1	Int	0~65535
DI Counter 3	30063	1	Int	0~65535
DI Counter 4	30064	1	Int	0~65535
DI Counter 5	30065	1	Int	0~65535
DI Counter 6	30066	1	Int	0~65535
DI Counter 7	30067	1	Int	0~65535
DI Counter 8	30068	1	Int	0~65535
DI Counter 9	30069	1	Int	0~65535
DI Counter 10	30070	1	Int	0~65535
DI Counter 11	30071	1	Int	0~65535
DI Counter 12	30072	1	Int	0~65535
DI Counter 13	30073	1	Int	0~65535
DO Counter 0	30190	1	Int	0~65535
DO Counter 1	30191	1	Int	0~65535
DO Counter 2	30192	1	Int	0~65535
DO Counter 3	30193	1	Int	0~65535
DO Counter 4	30194	1	Int	0~65535
DO Counter 5	30195	1	Int	0~65535
DO Counter 6	30196	1	Int	0~65535

DO Counter 7	30197	1	Int	0~65535
DO Counter 8	30198	1	Int	0~65535
DO Counter 9	30199	1	Int	0~65535
DO Counter 10	30200	1	Int	0~65535
DO Counter 11	30201	1	Int	0~65535
DO Counter 12	30202	1	Int	0~65535
Holding Register, Unit : Register(16 Bits)				
AO Ch.0	40020	2	Float	By Channel Type Setting
AO Ch.1	40022	2	Float	By Channel Type Setting
AO Ch.2	40024	2	Float	By Channel Type Setting
AO Ch.3	40026	2	Float	By Channel Type Setting

3. Internal Register Data

This table stores 48 sets of Internal Register data provided by WISE controller.

Parameter Name	Modbus Address	Length	Data Type	Range
Holding Register, Unit : Register(16 Bits)				
Internal Register 01	40040	2	Float	Floating Point
Internal Register 02	40042	2	Float	Floating Point
Internal Register 03	40044	2	Float	Floating Point
Internal Register 04	40046	2	Float	Floating Point
Internal Register 05	40048	2	Float	Floating Point
Internal Register 06	40050	2	Float	Floating Point
Internal Register 07	40052	2	Float	Floating Point
Internal Register 08	40054	2	Float	Floating Point
Internal Register 09	40056	2	Float	Floating Point
Internal Register 10	40058	2	Float	Floating Point
……..				
Internal Register 45	40128	2	Float	Floating Point
Internal Register 46	40130	2	Float	Floating Point
Internal Register 47	40132	2	Float	Floating Point
Internal Register 48	40134	2	Float	Floating Point